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The Disregard of Standard Methods and Its Effect on Prosthetic Dentistry.

By N. J. ESSIG, D.D.S., Philadelphia, Pa.

It might be well to preface the remarks which are to follow by disclaiming any intention to arraign or criticize the dental manufacturing companies, or to imply that there are not prosthetists who are following the teachings received during their college education, but the responsibility for the condition of prosthetic dentistry to-day rests somewhere, for there is undeniably a tendency to fall behind and disregard methods which have been proven requisite and necessary in attaining best results.

Naturally a manufacturing company will not manufacture nor produce articles of a variety for which they have no demand; the stock carried by mercantile houses largely depends on the demand; in other words, if the trade wants a particular article the manufacturer is not long in finding it out, and will soon have a supply equal to the demand, whatever that may be. It is strangely true that at the present time, when everything is being imitated so closely that it is impossible to detect the imitation, prosthetic dentistry seems to have fallen behind the pace set in other arts, and is not even up to the standard of thirty years ago. This is a singular fact, for here is presented to us one of the best opportunities for artistic reproduction and display of skill.

ITEMS OF INTEREST

Artificial Teeth Criticized.

That more attention has not been paid to this feature, the dentist alone must bear the responsibility. His capabilities are only limited by the fact that in many instances he can not buy at the dental depots what he must regard as his raw material. To make clear these thoughts we may take for example the molds and shades of porcelain teeth obtainable.

These differ materially from the old ones, which were comparatively few in number, but natural and lifelike in appearance, while those of to-day are numerous with either very pale, or muddy shades of green and brown predominating.

The most noticeable change has been in the bicuspid and molars. These are so small and present such a meager grinding surface that they not only do not give the patient the area of surface required for normal mastication, but they present an unnatural surface to the tongue and form a place for the lodgment of food. These fail to restore the mouth to its normal condition, and the writer believes that this feature of prosthetic dentistry is as important as any other.

The patient is required to become accustomed to a mechanical contrivance, and it is the duty of the prosthetist to render the mouth as nearly normal as possible, so that in talking and eating the tongue may come in contact with surfaces and objects as nearly like those bestowed by all-wise Providence as may be.

We were all taught that the use of cross-pin teeth was to be avoided except where the case absolutely would not admit of the use of a straight-pin tooth, yet it is impossible to find an assortment of straight-pin teeth sufficiently large from which to make a selection, and those in charge of that branch of dental supplies will inform the purchaser that they are not carrying much of a stock of straight-pin teeth because they have no demand for them. The question arises, "Why is there no demand?" The answer naturally suggests itself, "Because the dentists do not want them." This is deplorable, because it is different from the teaching received from men who thought out and systematized mechanical dentistry, and also because it is our duty to patients in our charge to give them the best and most permanent, no matter what trouble is entailed. This will surely prove bread cast upon the waters, if we feel that there must only be a commercial view of the operation.

Supplies Retired Because of Lack of Demand.

There are many articles which have formerly been in daily use in the office and laboratory of the average practitioner, which are not easily obtainable now; for instance, the white paraffin articulating wax used for obtaining articulation in plate and

crown and bridge work. This wax was rigid and required quite a good deal of manipulation to make it soft enough for use. Once, however, the operator obtained a good "bite" in this wax he was able to remove it, and place it on the plaster model without any change thereto; this is one of the most important details pertaining to the making of a satisfactory denture. The fact that it entailed some trouble to warm and soften this wax was sufficient reason for the majority of dentists to look for a softer variety, one that could be worked more quickly and with less trouble; the inevitable shortcut; consequently the dental depots gave the dentist what he wanted, a wax which in no way is as reliable, nor does it take the place of the old white paraffin wax. There is another variety of wax which is very important in the construction of vulcanite work, known as base-plate wax. The base-plate wax we get at the present time is not suitable for vulcanite work; it is too thick to use two thicknesses, and too thin for one thickness, yet we were taught that to make the neatest vulcanite denture, two thicknesses of thin base-plate wax, when pressed separately upon the model, made the thinnest and most uniform vulcanite dentures. This wax can only be had now by having it made to order. Many dentists have never during their professional career used the thin wax above mentioned, and one of the rarest things in dentistry is the swaged trial plate, made of air-chamber metal.

**Good Methods
Abandoned.**

It is surprising to learn upon inquiry the number of fundamental rules of dentistry which are entirely ignored by the profession. The making of clasps, for instance, is a feature of the prosthetist's work which is sadly neglected, and in consequence is condemned and blamed for the trouble really caused by maladaptation. Few men go to the trouble to mark their model properly and make a pattern which corresponds to the marking; in fact, few men study the case and make a plan at all. The practice of making the clasp concave so that only the edges come in contact with the tooth, and the intelligent bending and adjusting of these attachments, seems to hold the attention and thought of the average prosthetist but little.

It is a matter of wonder that many of our practitioners use impression plaster for all purposes; that impressions are many times taken with the modeling compounds, and instead of using soldered attachments for teeth on full and partial pieces, the plate is struck up and the teeth attached by means of vulcanite rubber.

It is obvious that several thin pieces of gold when swaged and soldered together not only gives the ideal adaptation, but also rigidity and strength, yet how many men make it their custom to do this in upper dentures, or even in lower ones? The fact that some of the neces-

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sary articles are unobtainable at the dental depots is the fault of the dentist, and while he alone must assume the responsibility of keeping up his standard, the dental depots must help and we would remind them that they have always professed an interest in doing this.

Laboratory Supplies.

In the matter of laboratory furnishing, there are a great many essential articles which are sold to us in a very inferior form. The wheels for finishing and polishing metal and vulcanite work which are presented for sale are much inferior to those we used to get, and many laboratory tools of special pattern are no longer to be had, the same claim being made; "that there is no demand for them."

The form of tinfoil known as pattern tin is rarely asked for by the profession, one of the leading manufacturing companies stating that they give away a great deal more than they sell. This is rather difficult to understand, because unless accurate patterns are made for most of the component parts of our metal work, the result must necessarily be inaccurate, and yet it is hard to find in the average laboratory, pattern tin of sufficient thickness to swage.

Many times we feel annoyed and vexed at the fact that we can not get the materials we desire, and our resentment is naturally directed toward the manufacturer, but at this point we must not overlook the fact that when articles are unobtainable it is proof positive that the majority of the dentists have discarded them. Manufacturers naturally produce that which they can sell most readily, and like all mercantile houses of the present time, will take care of the man who buys his goods and supplies in the greatest quantity. An instance of this kind came to the notice of the writer a short time ago when asking for certain teeth; he was told "that the molds had been destroyed, and that there was no demand for them." During the conversation he was shown a small tooth of the hue obtained by years of tobacco chewing, and informed that there was a man who twice a year bought one hundred sets of fourteen teeth each of this same mold and shade, and that he did not use any other size or color.

The retrograde movement in porcelain teeth has not come upon us suddenly. For years the writer has had a large experience in prosthetic dentistry, and it has been a noticeable fact that each year it becomes harder to maintain the standard he has always set, and in anticipation of this, learned mold-making so that he could make his own molds in cases where he found it was impossible to obtain that which would answer the purpose in the stock carried by the different manufacturing establishments. A manufacturer of porcelain teeth recently made the remark, "It is a fact that the teeth are not as good with regard to size,

form and shade as they used to be, but the dentists are getting what they ask for; the dental depots naturally make the molds that are most saleable."

It would seem that the same difficulty in obtaining and replacing some of the necessities in dentistry extends throughout all its branches, though to a more marked degree in prosthetic work. We are better equipped at present in many ways than at any other time in the history of dentistry; we have appliances and paraphernalia which enables us to do many unique things and in the easiest possible manner. We have the electric furnace, the casting machine and numerous contrivances for making seamless crowns; in fact, a host of appurtenances which not only facilitate, but largely contribute to the amusement of the operator. These inventions engross his attention and that of the dental societies seemingly to the exclusion of some of the more important details of dentistry, which are the foundation of our work. These innovations have their place and are very valuable adjuncts, and there are presented to us instances where they may be made use of to infinite advantage, but it is hardly likely that bridges, dentures and the like will be dispensed with; therefore, it is still necessary that this work should be done, and those who still take pride in this branch of dentistry undoubtedly will wish to do so after the most approved methods.

It has been said that when the dentists essay to write or speak about other than the newest devices, they turn back fifty years for their subject, while many features of their present professional work requires their attention and thought to a greater degree. There seems to be a tendency to be satisfied with the present imperfect state of affairs and to hunt at all times the short cut. This is especially true of recent years, and can not but end disastrously, for dentistry is no exception to the old rule, "that to stand still is to go backward," and this we surely are doing.

The writer has made an effort to point out as he sees it certain difficulties and shortcomings without placing blame or responsibility on any person or persons. A certain amount of responsibility must be assumed by those directly and indirectly concerned in our profession, and if the dental manufacturing companies cease to produce that which is necessary to the maintenance of a standard to which some of us aspire, and leave the management and manufacture of their porcelain teeth to those who may in no way be considered artists, they should not take exception to the fact that it has been noticed. On the other hand, if our practitioners discard and cease to use appliances and necessities required to do the best work, they should not place the responsibility on the manufacturers. The hardship really falls upon the conscientious man, who is not

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afraid to devote his time, thought and skill to producing that which not only fills the necessary requirements, but is also most artistically and thoroughly wrought.

This article is an earnest, heartfelt appeal for more conscientious work, for better adherence to the principles and details which can not fail to produce the best results, and while it is necessary to keep abreast with the times, there are certain old-fashioned rules which must not be allowed to fall into disuse, for just as surely as this is allowed to occur, just so surely will creditable results and esthetic productions from the laboratory of the prosthetist become a thing of the past. Whether or not there exists a tendency to lay too little stress upon the details of our work by those whose function it is to train the student in the fundamental principles of prosthetic dentistry, or whether the students naturally fall into careless ways, must be decided by members of the profession who have sufficient interest in the future of dentistry to try to stop this retrograde movement and replace dental prosthetics to the position where it properly belongs, and keep it moving forward until that position is commensurate with its possibilities.





A Contribution to the Knowledge of the Etiology and Treatment of Cases in Class II.

By RODRIGUES OTTOLENGUI, M.D.S., LL.D.,

Read before the American Society of Orthodontists, Detroit, 1907.

Adenoids cause malocclusion. This is an old story. Adenoids compel mouth breathing, and mouth breathing produces irregularity. This is the second version of the same story. In the expounding of this doctrine the various theorists have described in detail the course of events which, beginning with adenoids usually ends in malocclusion, and there has been a remarkable unanimity of opinion. Two main factors in the production of malocclusion have been recognized; arrest of development, and adverse mechanical forces during the eruptive period. I shall not antagonize any of these theories, speculative though they be, but I beg your indulgence while I tell the same tale with the accent in a different place.

Coming at once to a discussion of that class of cases with which my title specifically deals, what is the accepted doctrine as to the etiology of Class II conditions, otherwise known as distal occlusion? It is that nasal obstruction, most commonly adenoids, causes mouth breathing; that this in turn induces an abnormal lateral pressure from the cheeks against the erupting teeth, thus narrowing the arch, which is the more readily accomplished because the drooping mandible takes the tongue away from its normal place against the vault. Incidentally it is mentioned that "the mandible is drawn back and fails to develop."*

* Angle. Malocclusion of the Teeth, p. 113.

ITEMS OF INTEREST

Malnutrition a Cause of Malocclusion.

From the orthodontists of the world I now ask serious consideration for the following proposition:
Malnutrition causes malocclusion.

Malnutrition is a special cause of malocclusions of Classes II and III.

The permanent teeth do not displace those of the primary set but erupt into a larger, and what is more important, an entirely different arch, and the bony process is new bone built about them during the eruption. Grant this hypothesis and it is evident at once that, if during this period of transformation there be an interference with normal functions there may and probably will be a lack of bone building nutriment. What will result? The permanent teeth, all larger than their predecessors, erupt into the same small arch which the temporary teeth had occupied, or into one insufficiently enlarged, because of insufficient nutritive elements. Thus the irregularities of the teeth, and the consequent malocclusion, will be in nature and degree constantly related to the extent and time of the disturbance in nutritional functioning. I am aware that this is not new. I know that it has been recognized and said before. Yet it seems to me that even with the most modern of orthodontists it has not been given that prominent place which it should occupy. For example, in connection with my subject, Class II cases, while all take into account the two causative factors which I have already named: (A) Lack of development, and (B) Adverse mechanical forces operating during the eruptive period, it is the second cause which has received the most attention, whereas, as related to treatment, it is the first which is of the gravest importance.

What is the common course? "Madam, has this child had its adenoids removed? No? Well, they must be removed before I begin my work. Your doctor thinks she is too nervous for an operation at present, and you wish to postpone it for a few months? Very well, we will postpone the regulating until after the operation, because we can not hope for a permanent result in the presence of adenoids."

"Adenoids! Adenoids! Adenoids!" What a cheap exhibition of scientific attainment this cry is! How easy to impress a patient thus with the acuteness of our diagnosis, and the accuracy of our treatment. And yet this dogma is erroneous. The cure of the adenoids, however important, is not the most essential step in the treatment.

The chief factor in the vast majority of Class II cases is the deficient development of the mandible. Let us relegate adenoids and other nasal obstructions to a second place in our thoughts, and examine first as to whether the mandible is undeveloped. What influence will this have?

The corollary is that the sooner the obstacles in the way of development of the mandible are removed, the more perfect and the more permanent will be the results of treatment.

**Dr. Angle's
Theory.**

What is the explanation of distal occlusion of the lower arch? Angle in the seventh edition of his "Malocclusion of the Teeth" discusses this subject.

As the most recent pronouncement I may quote it here. He says (pages 115-16) :

"It is easy to understand the beginning of malocclusion of the teeth in this class of cases, and the various stages are readily followed. At the time of the eruption and locking of the first permanent molars which marks the true beginning, the condition for the mal-locking of these teeth is most favorable. The occlusal surfaces of the crowns of the deciduous teeth are comparatively flat, their cusps having largely disappeared so that they can no longer exercise much control over the proper relations of the jaw when closed. The mandible instead of being held forward by the cusps in their locking is allowed to close more or less distally to normal." . . . "So, as the first permanent molars erupt and the cusps feel their way into occlusion, the lower molars may erupt in distal occlusion, not always in full distal occlusion at once, for very often only the minute points of the cusps touch for some time, as if hesitating which side of the planes of the cusps they will follow. Probably only a few hours in many cases decides the position they will ultimately assume, whether it shall be normal or abnormal, but when once established their course is progressive until their full normal or distal occlusion ultimately takes place."

It will be noted that this doctrine fixes the beginning of distal occlusion at the time of the eruption of the first permanent molars, although later in the work Dr. Angle records Dr. Mendel's case and admits that distal occlusion may exist in the deciduous denture, which, he says, "is not remarkable since nasal obstructions from adenoid growths are often well defined at two or three years of age."

I will not dispute the fact that distal occlusion of the lower arch may occur as Dr. Angle describes, but that the above is the sole explanation is most doubtful. If we consider analytically that part of the theory where the erupting lower molar is "feeling its way," while we may admit that it may erupt into distal occlusion, Dr. Angle does not tell us why it ever does. Personally I can not believe that normal or abnormal molar occlusion can be due to casual activities, operative during only a few hours. On the contrary, I think much more persistent causes for distal occlusion are at work.

For example, Dr. Angle admits, and we all know, that there may be distal occlusion of the lower arch in the temporary teeth. In such instances, presuming that the malocclusion be not corrected, the first permanent molars are compelled to erupt in distal occlusion, which often is more pronounced in the permanent than in the deciduous set, for the reason that the inclined planes are more powerful.

Dr. Angle recognized the necessity of explaining the subdivisions of Class II, where the distal occlusion is unilateral, and he advances two hypotheses. He points out that the eruption of the teeth in the two lateral halves of the jaws are rarely simultaneous, and intimates that mouth breathing may produce distal occlusion on one side, and may be overcome prior to the eruption of the molars on the other side, thus permitting normal occlusion on that side. The alternative hypothesis is a curious one. He says: "The majority of such cases are, however, in the author's opinion directly traceable to the premature loss of the upper first or second deciduous molars, or even of teeth anterior as may often be noted."

In connection with the first theory, I would point out that if asymmetrical locking of the molars is ever due to the fact that on one side the molars erupt during a mouth breathing period, which habit is overcome prior to the eruption of the molars on the other side, then it should follow that in subdivision cases, the patient should never present to us, still a mouth breather, having according to the theory already been cured of the habit.

The second theory is equally inopportune, for if the distal occlusion of one lower molar is due to the premature loss of an upper deciduous tooth or teeth, resulting in the drifting forward of the first molar, such a case would not really be a Class II case, for two reasons: First, there would be no distal pose of the chin, a characteristic always present in Class II; and secondly, the forcible movement of the upper first molar back to the place from which it had drifted, would place the case in Class I, where it really belongs.

How then are we to account for the distal occlusions of Class II. Briefly, with the word "Malnutrition." There is from whatever cause you may find, and the causes may differ in different individuals, a deficient growth of the mandible. Second, there may be a deficient development of the processes of the lower jaw, considered mesio-distally.

ORTHODONTIA

Protrusion in Class II.

We have in the past too often used the word "jaw" indefinitely. In the future we should discriminate between jaw and process. It would be more accurate to confine ourselves to maxillæ, mandible, and process or arch, and drop the word jaw as far as possible. For example, "protruding upper jaw," "protruding lower jaw." "What is meant?" Do the words carry the same thought to all minds? The general practitioner commonly uses the words "protruding upper jaw" for Class II cases.

Has anyone present ever seen a "protruding upper jaw" in Class II? I never have; neither in my own practice nor reported by others. I have seen more or less protrusion of the upper teeth, and let me here advance a dogma. Approximately in ninety per cent. the following will be found to be true:

In Class II, Division I, draw a circle, the circumference of which will include the incisal edges of the upper lateral incisors, then reduce the centrals to conform to that circle, and all the protrusion of that upper arch will have vanished. Of the ten per cent. of cases which will be the exception to this rule, the majority will present with the laterals really lingual of their proper place in the arch, while only a few will have the laterals really prominent. Should there be cases where the four incisors are protruding from apex to crown, they would, in my opinion, be monstrosities, and as yet I have no knowledge of any such case in Class II.

Deficient development not alone explains distal occlusion of both lower molars, but perhaps it likewise accounts for the asymmetrical conditions. Dr. J. P. Gray, at the last meeting of the National Dental Association, read an instructive paper in which he reported his discovery of many mandibles normally long on one side, and abnormally short on the other.

The true explanation of distal occlusion, to my mind, is the disproportionate development of the jaw which is distal to normal in relation to the profile. And here I approach with some timidity an hypothesis, *which I advance rather for further study, than for immediate and unconsidered adoption*, even though my own experience leads me to believe that it is the true solution of all those malocclusions commonly known as "protruding jaws." The theory may be tentatively stated thus:

In all cases of seemingly protruded jaws (in Classes II or III), exclusive of true monstrosities, we have distal occlusion due to deficient development. In Class II cases, there is distal occlusion of the lower teeth, due to a deficient development of the mandible, of the arch, or of both.

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In Class III we have a distal occlusion of the upper teeth due to deficient development of the maxillæ, of the upper arch, or of both.

I appreciate the fact that this statement is revolutionary. If I understand Dr. Angle aright, it is the lower molar which is always at fault. According to his view the upper first molar is practically constant, mesio-distally in relation with the profile.

If this be true, diagnosis would tell us that treatment of Class II cases necessitates the forward movement of the lower arch (and mandible if possible) into normal occlusion, the upper first molars being left (mesio-distally) practically as found. Contrariwise, the treatment of Class III cases would involve the distal movement of the lower arch (and mandible if possible) into normal occlusion, the upper molars being left (mesio-distally) practically as found.

According to the hypothesis which I have the honor to present, the treatment of Class II cases would involve the forward movement of the lower arch (and mandible if possible) into normal occlusion, the upper first molar being left (mesio-distally) practically as found.

Treatment of Class III cases would involve the forward movement of the upper arch (and maxillæ if possible), into normal occlusion, the lower molars being left (mesio-distally) practically as found.

Thus the treatment of Class II is the same under either hypothesis, the seeming divergence occurring in relation to Class III, though there is a fundamental difference in both, which I may as well indicate at once. One plan recognizes the need for forcing the teeth into normal occlusion, and hoping for aid through inciting a renewal of developmental activities. The other recognizes at once that the chief trouble lies in the fact that the jaw in distal occlusion is disproportionately developed and that no mere mechanical rearrangement of teeth will achieve the best result, unless the full development of the faulty jaw can be brought about.

The one theory renders early intervention advisable; the other makes it compulsory.

If we accept this theory that apparent protrusions are really retrusions, due to deficient development, we see at once the need of early intervention, because the sooner the obstacle to development be removed, the longer will be the period between intervention and complete growth of the individual, and therefore the greater will be the advantage of reinaugurating development. Contrarily, the greater the delay prior to treatment, the greater will be the deformity due to deficiency of development, and the shorter the time for future development. This is of inestimable importance in the consideration of Class II cases, where we are to deal with a deficient development of the mandible. For example,

if a mandible be locked into distal occlusion at the age of six, and if by treatment it be released at that time, then at the age of sixteen that mandible will have had ten years of unrestrained development and a normal profile will have been established, and of course will be permanent. But if treatment be deferred to the sixteenth year, that mandible will have suffered from deficient development during all that period, and treatment

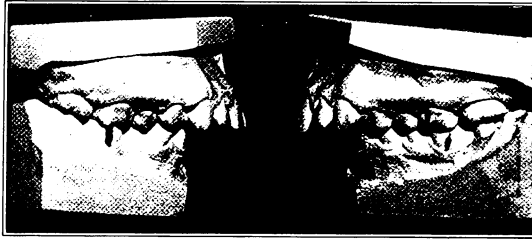


FIG. 1.

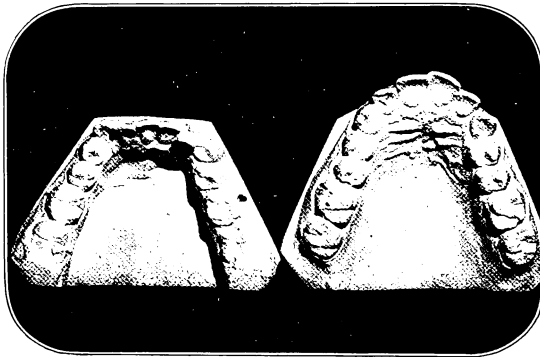


FIG. 2.

must be entirely different, because of the fact that so little time is left after treatment for future development, during the normal period of growth.

**Jumping the
Bite.**

Dr. Kingsley long ago announced the doctrine of "jumping the bite" in these cases, but Dr. Angle has pointed out that in cases treated after the full complement of teeth has erupted, while of course the bite may be jumped, the mandible will not always remain in the for-

ward pose, even though the occlusion may be sustained ; that, indeed, the mandible may drift back distally, sliding as it were under the processes, leaving the lower arch still in normal occlusion. This is very important, and I have no doubt that it is true. Hence we may as well comprehend the fact that in *very young cases* we may really jump the bite, which

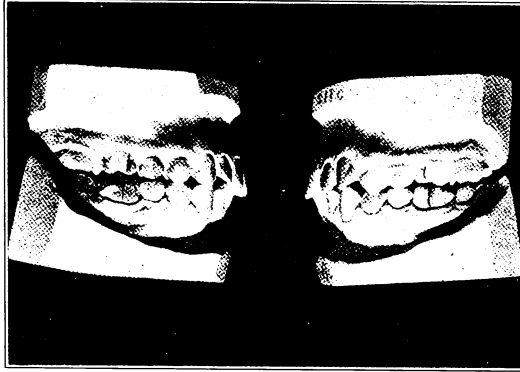


FIG. 3.



FIG. 4.

means to move the mandible and arch forward. After full eruption we may by intermaxillary force move the lower arch forward, thus "jumping the occlusion," but the mandible because of deficient development is not apt to retain a normal forward pose. Between these ages we may achieve compromise results ; to some extent jumping the bite, and to some extent jumping the occlusion.

I will now show cases exhibiting the two extremes :

In Fig. 1 I show you the profile casts of Miss D., aged fifteen. This is one of the most extreme cases that I have seen, but it is only by such a case that we may fully comprehend the possible results of delayed treatment. I ask you to note the extent of the apparent protrusion; the upper six anterior teeth are all in advance of the lower.

The history of this case is unfortunately obscure. Nothing could be learned of the deciduous teeth. Yet I can not but believe that the same conditions existed with the temporary, as we observe in the permanent set, though to a less degree. There had been an operation for the removal of adenoids, which, however, in the opinion of the mother, "was not necessary." Neither would the mother admit any mouth breathing, never "having noticed it." Such a history, of course, is of no value. In Fig. 2 we see the occlusal views.

An examination of the upper cast shows a surprisingly slight departure from a normal arch. It is a little narrow, and the central incisors are a little prominent. In the lower, however, we see all the trouble. The four incisors are all lingual of normal and this, with the distal occlusion, accounts for the greater part of the seeming protrusion. Treatment therefore demanded the labial movement of the lower incisors, and the mesial movement of the lower arch and mandible if possible. At the same time it would be necessary to widen the upper arch to normal, and then to reduce the prominence of the central incisors. It may surprise some of our experts to hear me admit that I have worked over two years on this case with a result far from ideal. Fig. 3 shows a profile view of the casts of the present conditions, and Fig. 4 the occlusal view. You will observe that I am still far from normal occlusion. It would tire you to go into the details of all the difficulties that I have met in the management of this case, but it is an opportune moment to touch on one phase which is an additional argument for early intervention. After the fifteenth or sixteenth year the girl child is growing to be a young woman, with the natural desire to join in the social pleasures of her companions, and old enough to object to the disfigurement of her mouth with orthodontic apparatus. She is also old enough to think herself entitled to have some say in the extent of work which she desires. For example, this young lady would never permit me to make any effort toward the torsion of the left upper cuspid. She likewise bitterly opposed tension on certain teeth which seemed unusually resistant and unusually sensitive to ligatures of any kind.

But the great trouble lay in the fact that the subject had a dense bony structure, and a powerful muscular development.

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The best that I could aim for was a compromise result; a partial forward movement of the lower arch, and a partial forward movement of the mandible. (Slides showing face before and after treatment exhibited, but the pictures can not be published.)

Supposing that the occlusion can be improved, the question arises, can this profile be maintained? I doubt it. The photograph was taken with a retaining device in place which compels the forward pose of the mandible. What the future has in store for this young lady remains to be seen,* but it is a striking example of the difficulty of obtaining ideal results late in life. Of course there is another logical deduc-

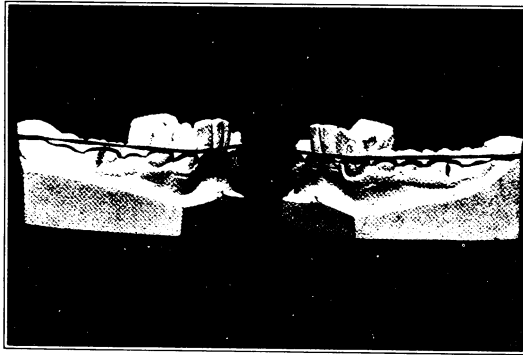


FIG. 5.

tion. Perhaps the operator has been not sufficiently skilful. Perhaps some more skilled orthodontist might have secured a better result in two years. Be that as it may, the argument holds, for the next two cases were done simultaneously, by the same man.

The Occlusal Plane in Class II.

Before passing this first case, however, I wish to touch on just one other point. I had originally intended to take up the subject of the occlusal plane in relation to Class II cases, but this paper is already too long, and I must let that pass for the present with just a word. A number of good orthodontists claim that in many Class II cases the lower incisors have erupted abnormally high, and that they must and can be depressed in their sockets. It has been claimed that a plate in the vault will serve this purpose, the patient biting his lower incisors down into their sockets. Others use mechanical forces applied to the teeth to

* At the present time, a year since the above was written, the occlusion is much improved, retainers being still in place.

R. O.

depress them. I can not believe that this is either possible or needful. I do not deny that teeth may be forcibly driven into their sockets, for I have done it, unintentionally. But with the removal of force the tooth or teeth will invariably return to normal height. I can not go more deeply into that at this time, but I show you Fig. 5, the lower arch of this

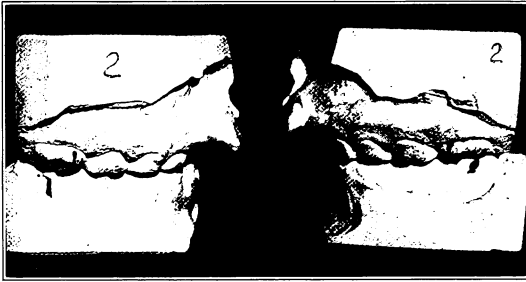


FIG. 6.

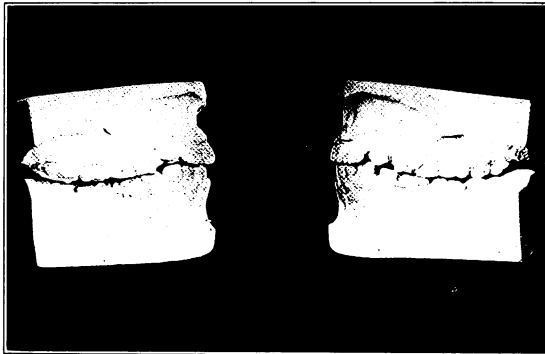


FIG. 7.

same case prior to treatment. Please note the black line which marks the occlusal plane of the bicuspid and molars, and then observe that the incisor crowns are entirely above that line. Could they be depressed in their sockets to assume a normal relation with the other teeth as here pictured? I think not. It is this fact which accounts for the length of the time of treatment of this case. There have been periods of rest occupying months, holding the incisors in more or less true relations, and awaiting the future eruption of the posterior teeth, for according to my belief in these cases the fault lies in the molar and bicuspid regions which have never achieved full vertical development.

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Next I show you the profile casts of a most interesting case (Fig. 6). A child, ten years of age, with such tardy eruption that we find the upper laterals still wanting. Dr. Angle has spoken of the fact that often during the eruption of the permanent teeth the deciduous set are so worn off that they exert no influence against the mal-locking of the erupting first



FIG. 8.



FIG. 9.

molars. In the case before you the temporary set have been retained so long that they are proportionately as much abraded as the teeth of a man of sixty. To such an extent is this true that the overbite is seen to be so great that the upper teeth almost entirely hide the lower. This is especially true of the cuspids, the labial surfaces of the lower cuspids being almost denuded of enamel. The deciduous set are already in distal occlusion. What must be the inevitable result of such conditions? With the lower deciduous molars in distal occlusion, the first molars are compelled to erupt in distal occlusion. The abrasion of the deciduous teeth

having allowed the abnormal closure of the bite, the molars, and later the bicuspid, are hindered from erupting to normal height. There is nothing to prevent the growth of the upper arch in the incisive region, producing apparently a protrusion, and there is nothing to prevent the full eruption of the lower incisors, which then appear to be too long,



FIG. 10.



FIG. 11.

whereas they are really normal, while the posterior teeth are too short, from lack of vertical development. The arrested development of the upper arch compels a similar insufficient development of the mandible. Observe that I say "arch" in connection with the upper, and "mandible" for the lower. I believe there may be a lateral growth of the maxillæ which fails to carry the processes with it, so that the arch remains narrow across the deciduous molar region. Yet later the bicuspid may erupt slightly outside the arch, thus rendering the lack of development less noticeable than is the deficiency in the mandible. But so long as this narrow temporary arch remains it acts mechanically to hinder the growth of the mandible and restrains it in the distal relation. It is most note-

worthy that the temporary cuspids exert a tremendous influence in the case before you. If the casts of the original condition are taken in the hands, it will be seen that they can not be moved mesially into normal occlusion, because the upper cuspids will not permit the lower arch to rest within their embrace. The significance of this is that it suggests a



FIGS. 12, 13, 14, 15 and 16.

simple procedure which may often prove of great advantage. If a child present with deciduous teeth still in place, with distal occlusion, and for any reason treatment must be deferred, an examination should be made to determine whether or not the upper cuspids lock the lower arch into distal occlusion. In such an event the judicious use of a corundum stone on the cuspids and perhaps also the molars may prove of great help, or better still, a simple device for widening the upper cuspid region could be used.

Fig. 7 shows the same case after only nine weeks' treatment. (Faces cannot be published.)

ORTHODONTIA

This child was a mouth breather and had adenoids, though at first the parent declared that a rhinologist had said they were not enough to render removal needed. Yet at a crisis in my work they suddenly determined to have the operation.

This case is in great contrast to the last, and I think emphasizes the advantage of releasing the mandible from its imprisonment as early as possible. But the next case is even more interesting.

Fig. 8 shows the profile casts of a child six and a half years old. There is distal occlusion of both temporary and permanent molars. Was there ever a more typical example of the evil results of adenoids and of mouth breathing? Yet the history of this case is most reliable. She is the daughter of a prominent and capable physician. She had never suffered from nasal obstruction of any kind. She has slight evidence of adenoids, but has never been a mouth breather, nor does she even snore. There is not a shadow of doubt in my mind but that this case, if left untreated, would develop to as great a deformity as the first case shown. The following illustrations show the progress made in this case in thirteen weeks. Fig. 9 shows the occlusal view before treatment. Fig. 10, profile casts after three months of treatment. Fig. 11, occlusal view. Figs. 12 and 13, profile and full face before treatment. As the photographer allowed the hair to hide the chin, a second photograph was made three weeks later, Fig. 14, by which we see that the mandible is already moving forward. Figs. 15 and 16 show the face at the end of three months' treatment.

What are we to think in the presence of such evidence as this? If such a condition can arise without nasal obstruction, can it be true that nasal obstruction is the *sole* cause of Class II conditions? I can not refrain from giving you the views of the father of this child. He says that adenoids mainly abound in localities of congested population: in large cities where towering walls and city dirt and dust makes the air foul and filled with foreign particles. He thinks it is not strange that eighty per cent. of children having irregular teeth should suffer from adenoids, because he declares that eighty per cent. of all city children have adenoids. He likewise points out that operative interference is not necessary unless the growths are sufficient to produce nasal obstruction, or hindrance to free breathing, and that unless this occurs, there can be little relation between adenoids and irregularity.

On the other hand he calls attention to the modern methods of feeding. Foods are soft and getting softer year by year. Breakfast foods are prepared for us so that the eater has little to do except to swallow. Can full development of a jaw be expected with such lack of use?

Gentlemen, I leave these thoughts with you for study.

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Discussion.

Dr. N. S. Hoff. This paper opens up a good many things that seem to me to need discussing, but many of them are of a technical character and I do not care to undertake the discussion of those points. I can not add much to the value of the paper, and have very little to find fault with, probably for the reason that I do not fully interpret the paper. I did not arrive in time to hear its reading. There are one or two points I will speak of, however, although I may have nothing new to say about them.

The essayist says he has seen upper protruding teeth, but never an upper protruding jaw. I can not so interpret the pictures he shows on the screen, for some of the illustrations I believe not only show upper protruding teeth, but protruding jaws as well. It seems reasonable to suppose we should have hypertrophy or overdevelopment of the upper jaw, rather than of the lower jaw.

If any of you will recall the work of Cryer in sectioning the skull, you will remember the great differences he discovered as to the formation of the air spaces—how much larger they were in some cases than in others, and yet how regularly the jaws were developed. I recall Dr. Hartz's presentation also as to the development of the jaws, symmetrically and concordantly, under the same nerve influence and impulses. I can not understand how one jaw can be overdeveloped and the other underdeveloped. How could nature fail of the same kind and extent of development when controlled by the same nerve influence, and when developed in the embryo in the same manner and at the same time? I can only account for it by some mere accidental causes. To undertake to establish a principle that one is overdeveloped and the other underdeveloped, it seems to me would be going a little too far. The underlying principle in development is harmonious.

The essayist says it is because of malnutrition that the mandible is insufficiently developed. As I have looked at all the pictures shown here during the past two days, it has seemed to me in every one of them, almost, I could see exaggerated development, if anything, in the nasal and facial region rather than a lack of development in the mandibular portion of the face.

We have types of individuals, or people, as well as animals. The bull dog has a strongly developed mandible and meagerly developed maxilla. When there is a variation from that in the bull dog, we know it is abnormal and he is a mongrel. We do not expect that in human beings of pure race or type that this law should be different. The jaws and face ought to be symmetrical. When they vary from that it is acci-

dental and does not come from any particular line of causes, so that you can not make a principle of it, embryologically or physiologically, to say nothing of building on that a principle of practice for the regulation of such malconditions.

I believe the location of the teeth in the jaws is, in every case, purely accidental when they are abnormally placed, and can not be attributed to a lack of nutrition.

You orthodontists seem to have adenoids on the brain and believe they are responsible for everything abnormal! Adenoids may cause this hypertrophied condition of the upper jaw, but other things could do the same, such as irritating influences of the nasal membranes during the period of development, diseases irritating the air passages alone or nervous diseases which influence the respiratory muscles of the nose, larynx, trachea, chest, etc. These accessory muscles, because of nervous disorders or affections, have much to do with the symmetrical development of the face.

Irritations occurring in the air sinuses of the face must have as much influence as stenosis from adenoid growths, or anything we may have of that kind. It is almost impossible for us to say any particular form of malocclusion is caused by adenoids, or any other particular disease. It may be a combination of any or all of many disorders.

I believe much more strongly than some of my associates in the contention of Dr. Angle as to the position of the upper first molar being more constant than that of any other tooth. I believe that he is right, and logically it ought to be so. Sometimes it is not so, but this is accidental and not a natural result. I should feel more thoroughly convinced, however, if he should make it the first molars of the lower jaw, for the reason that the mandible ought to be developed more normally than the maxilla. It is subjected to less accidental interference in development than the upper. There is absolutely nothing to interfere with the development of the lower jaw, unless it be unusual accident. There are no air sinuses here, which are liable to become infected and diseased during early life. The jaw simply develops in the muscular fascia and the muscles surrounding it which hold it in shape. The buccal muscles, muscles of the neck and the tongue, hold it in proper form. It has a free and liberal supply of blood. The nerve supply is as good as that of the upper jaw, so why should it not develop into normal size and form? There is no reason except it be an accidental reason, and there are not anything like so many chances of its being badly developed as in the case of the upper jaw, where there are so many changeable conditions, because the bones are so thin and frail that they may be so easily disturbed.

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The growth of bone is interstitial. The mandible develops from six centers, and is one of the first bones formed, and it should usually be normally developed. If I were to make a suggestion it would be that we take the lower first molar as our standard; when the jaws are in normal relation we can then develop the rest of the face in accordance with that.

The question of nutrition can have little to do with unequal development, as the nutrition would be similar in both cases, and it is concordant. Why should the upper jaw develop excessively at one period and the lower at another?

I can not see then why we should speak of the mandible as being insufficiently developed. Sometimes we see people without chins, and we think of them as lacking in character and mentality. Some of us have to grow whiskers on our chins to make a presentable appearance! The mandible and the chin should develop in uniform relation to each other, and when they do not it is because of some purely accidental cause, and the cause can not always be attributed to malnutrition.

The upper jaw is as often at fault, in my judgment, as the lower, and instead of trying to develop the chin we might, with equal propriety, try to reduce the hypertrophied growth we have in the upper jaw—reduce the nose and face and bring things into harmony.

The pictures Dr. Ottolengui has shown us, in most cases indicate that the middle part of the face is usually not longer than normal, but there is always a fulness and prominence that do not belong there. It is not natural or harmonious.

We may think Dr. Angle is wrong in his statement as to the position of the upper first molar tooth, but if you will make it the lower first molar, that is in normal relation to the jaw, I believe you will have discovered a valuable truth.

The essayist describes the dogmatic manner
Dr. Milton C. Watson. some men have in dealing with patients afflicted with malocclusion. It certainly indicates a very meager comprehension of the subject for a man to declare adenoids to be the sole cause of malocclusion. It seems incredible that any man could ascribe the malocclusion to any one cause, for it is so apparent that there is a great combination of factors involved. It is quite true that we have not as yet been able to determine absolutely the relative importance of each of these factors, and it is equally true that many men believe nasal occlusion occupies a very important position, with which I heartily agree. The very fact that complete nasal occlusion not only interferes with the function of the nose, and thus in turn with the development of the

maxillary sinus and its surrounding bony tissues; but that this disturbed function also compels disuse of the jaws and teeth, which in itself is a vital consideration, compels us to give heed to this condition. It must also play a part in malnutrition—another factor of some importance. I quite agree with the sentiment that too much importance has been laid upon the stress of the cheek muscles; it is, however, a perverted function, and if associated with a *short upper lip* is of some importance.

It would, in my judgment, be quite as unwise to utterly ignore the nasal involvement as it is to go to the other extreme and hold that it is the one and only factor demanding consideration.

Discussing the etiology of distal occlusion further, the essayist shows the inconsistency of Dr. Angle's deductions, and rather intimates that because his book is the most recent addition to the literature of orthodontia, that the ideas therein contained express the generally accepted thoughts of the day. I believe this is quite true so far as the means and methods of achieving tooth movement and permanency of results are concerned, but the enormous energy and time the man has expended in this direction has, I believe, left him little time for investigating the etiological factors, in which he has been too hasty in his conclusions. He has done so much, however, for which we are indebted to him, that we should consider his errors with a generous amount of charity, though I do not mean you to infer that I think they should not receive adverse comment.

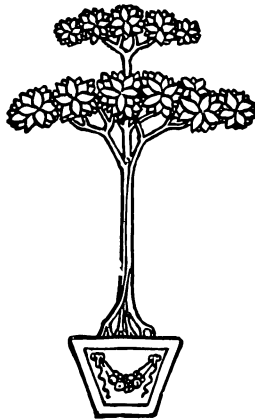
I am in perfect accord with the idea that deficient development of the mandible in Class II cases, particularly Division I, is the most troublesome and about the most conspicuous factor with which we have to contend directly; and that deficient development of the maxilla becomes an equally prominent factor in Class III cases. This, of course, is in direct opposition to the idea recently advanced that the upper first molar is practically always in its correct mesio-distal position. I am already on record as being utterly unable to believe that the position of this tooth is anything like as constant as some writers claim it to be, and further observation continues to strengthen this belief. The fixing of the time at which distal occlusion begins as being simultaneous with the eruption of the first molars is, of course, so utterly unscientific as to scarcely be worthy of notice, except for the prominence of the man suggesting the idea—the fact that complete distal occlusion in the temporary teeth has been seen by numerous operators being conclusive proof to the contrary.

I think it well for us to consider carefully each case by itself, in our efforts to find just where the fault lies in any case of malocclusion, rather than to accept a dogma which compels us to believe that in all Class II,

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Division I cases the trouble is solely an underdevelopment of the mandible, and that in Class III cases it is solely a deficiency in the maxilla. I believe that these conditions are usually present to a greater or less degree, and I am equally confident that I have seen upper molars that really needed to be moved distally, and some cases of an undue prominence of the mandible itself. I recognize the fact, however, that an unfortunate angle in the mandible may mislead one in making a hasty examination.

(Further discussion was postponed, and Dr. Baker was called to read his paper.)





The Principle of Retention for Cast Gold Inlays.

BY F. T. VAN WOERT, M.D.S., Brooklyn.

*Read before the Central Dental Association of Northern New Jersey,
April, 1908.*

The principle of retention for cast gold filling differs so greatly from that for any of the other fillings that I fear it will be some time before it is generally appreciated, and until it is, cast gold will not hold its proper position as the most practical and nearest the ideal of all the methods for the restoration of lost tooth structure. And it is the purpose of this discourse to prove the truth of the above statement and if possible bring about the general adoption of this most wonderful method of filling teeth.

That we have entered upon a new era in the practice of dentistry is beyond argument. Dr. Jenkins's perfection of the porcelain filling opened the way for a display of our talent in the arts that was impossible before.

The utilization of porcelain, together with Dr. Taggart's method of gold manipulation, places us in a position to demonstrate to our patients that we are masters of the situation and the result must be an appreciation which in turn will be productive of a more equitable compensation for our services than has existed in the past. There is probably no class of professional men so poorly or disproportionately paid for their skill and downright hard work as the members of the dental profession. The labors have been so arduous that many break down and are cut off in their prime.

Two or three large gold fillings of the old type, if properly inserted, would be enough in one day to physically incapacitate the operator

for anything but a bed and several hours' absolute rest. Such work curtails and restricts opportunities for anything but a fair living and perhaps saving enough to maintain one, if economical, in old age if fortunate enough to live to that state.

On the other hand the new method of cemented fillings makes possible at least three times as much work with half as much nerve strain and fatigue. My deductions on cavity formation are based upon clinical experience dating from February, 1907, to the present, beginning about one month after Dr. Taggart had introduced his method to the profession.



FIG. 1.

In the beginning my cavity formation was identical with that for porcelain or the gold inlays as made by Drs. Hinman, Nyman, Dills and others, but I soon found it necessary to adopt a distinctive type for the cast gold. The particular feature which brought this to my attention was the possibility of securing an absolute occlusion, a result impossible with any other method.

Extensive dovetailing or undercutting I found unnecessary and the complication of steps and fissures a decided detriment for a successful result, and where walls are at right angles they should be prepared with curved lines rather than the sharp square so common in the step form. First; because there is less liability of fracturing the enamel. Second; the chances of securing an accurate impression or wax reproduction of the cavity are

very much improved. Third; any little defects in the casting are usually corrected without a sacrifice of any of its other parts. Fourth; a more accurate butt seam may be secured with comparatively little trouble. My experience with a lap seam has been anything but pleasant. Fillings of this kind usually come to grief, particularly at the cervix. Gold differs from other metals usually cast in that it is very much more malleable and I believe this property increases with its use in the mouth, under the stress of mastication. Personally I believe an alloyed gold preferable to the pure. It certainly adds very much to the retention of such a filling.



FIG. 2 A.



FIG. 2 B.

A very important consideration in preparing a cavity for cast gold is a possibility of encroachment upon it in repairing defects in the same tooth which may develop later. If too great extension has been made for retention, it is liable to necessitate the removal of the entire filling later. If the inroads of caries has proceeded to such an extent that it encroaches upon a field which would be necessary in the anchorage of another filling, I believe in extension for prevention. An illustration of these conditions is better shown in Figs. 1 and 2. Fig. 1 shows an approximo-occlusal cavity prepared without angles, and with a dovetail lock in the morsal surface.

Fig. 2 shows a tooth where the extension for prevention has been carried into the opposite approximal surface. I believe it is often a decided advantage to remove this portion of the tooth to prevent a recurrence of decay down on the other approximal wall. But instead

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of carrying the cavity down to the cervix, as has been done on the other side (Fig. 2, A), it is extended partly below the point of knuckle (Fig. 2, B). My observation leads me to believe that the majority of cases of caries start at a line just below the point of approximal contact; therefore if there is no decay on that surface at the time of making the filling I believe it perfectly safe to cut only below that point, and the balance of the tooth need not be encroached upon for any prevention.

Figure 3 shows my method of cavity formation for the regular approximal fillings.



FIG. 3.

This shows an upper bicuspid and represents a cavity as I would prepare it if the caries had only proceeded a part of the way through the sulcus.

The conditions represented in these three models apply to the molar and lower bicuspids and the treatment is identical.

The six anterior teeth require a cavity formation which places a stress upon the greatest surface of the gold wherever possible. Few centrals or laterals are thick enough to permit slotting the incisive edge as is often suggested. Many of the illustrations appearing in the text book show cavities of that character, viz., with the step cavity having a slot in the incisive edge. Any of the six anterior teeth having sufficient room for slotting in that way are so seldom found, that it is hardly worthy of consideration. I believe a cavity can be prepared so that it will retain a filling, yet avoiding any such mutilation of a tooth as that represents.

**Importance of
Correct Occlusion.**

The retention of cast gold fillings lies as much in the occlusion and the restoration of knuckle as it does upon the cavity preparation or cavity formation. In other words I believe that if a cavity be so formed that a filling when placed in it has an even stress upon every portion of its surface, the act of mastication will drive that filling into place and it will require very much less anchorage than in any other way.

In the case I have in my hand all of the work was cast gold. The



FIG. 4.

second lower molar represents the restoration of two-thirds of the tooth with a very small anchorage, which I will show you later. Dr. Dills, who is present, has in his mouth a restoration as extensive as this and without any more anchorage than this and has been wearing it for many years with perfect success, and I do not believe that the cavity formation of that tooth is nearly as much a factor in its maintenance and retention as the fact that the occlusion is correct. In the second upper molar there is a like condition shown. In the first upper molar is a filling carved by eye to an approximate occlusion which would, in a practical case, last but a very few months I believe. The crown *there* shows a pure gold casting with porcelain baked in, and the occlusion of that is absolutely correct or as nearly so as it is possible to make it.

The theory of extension for prevention as promulgated by Dr. Black is an entirely different proposition from that of extension for retention of

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cast gold fillings. As I stated before, there is a fixed point at which caries usually sets in and if that particular point is eliminated the chances are nine out of ten—yes, ninety-five out of one hundred—that with proper care there will never be a recurrence in that vicinity.

Fig. 4 shows a retention cavity for an inlay without encroaching too much into sound tooth structure.

Fig 5 represents a molar where the caries has been so extensive that it has encroached upon the area which would be necessary for the maintenance or retention of a filling on its opposite surface or opposite side,



FIG. 5 A.



FIG. 5 B.

therefore the extension has been made carrying it over into the opposite approximal surface. and I believe that a cast gold filling fitted to a cavity prepared as that is, will last for an indefinite period. Fig. 5 A, the original cavity. Fig. 5 B, extension into opposite approximal surface for retention and prevention.

You will notice that on all these models the margins are square, making so-called butt seams. Nor is there a square corner in any one of these cavity preparations, and they are purposely omitted because I believe they are very difficult to fit, and if by any chance there is any little defect in casting at that particular point, it will necessitate making an entire new filling.

Dr. Ottolengui.

Some of these gentlemen would like you to explain just what you mean by a lap seam.

Dr. Van Woert.

A lap seam is where the filling material lies over, instead of on to.

If the filling comes down square against the surface, that would be a butt seam; if, on the other hand, that surface is beveled off and the gold allowed to run over it, with the idea that, being thinner at the point, it could be more easily burnished, which is the object for making a lap seam, then I believe that this filling is bound to change somewhat in its molecular formation and by the stress of mastication. The chances are it will separate at that point later and leave an opening for the collection of bacteria and the recurrence of decay. On the other hand, with a butt seam it is utterly impossible to cause any such defect.

Another advantage of the butt seam over the lap seam is that you do not weaken your wall. Wherever they are beveled for the purpose of making a thin edge, for the purpose of burnishing, you not only weaken the filling but the walls of the tooth to which you attach it.

The question of retention depends, as I have said before, upon the occlusion as much as on the cavity formation, and another very important factor is the gold which is used for making the casting.

Choice of Gold.

Dr. Taggart advocates the use of pure gold and quite a number of others do so. I prefer non-oxidizable gold to anything else, because it does not change color. This alloyed gold costs practically the same as pure gold, but while it is soft enough to be burnished it is hard enough so that it will not change under the ordinary stress of mastication. I believe that it casts fully as well as the pure gold and being a little harder, or of a different texture so to speak, it will stand up better and be the means of helping the maintenance or retention of that filling, quite as much as the occlusion, the knuckle and the cavity formation.

Another factor that plays a very important part in retention is this— if the restoration of knuckle between the bicuspid and molar is not thoroughly established, I do not care how well that filling is made, nor how well the cavity is formed, there will be some trouble, even if it is no more than the breaking down of the edges. I believe that if the filling is properly knuckled so that it comes in proper contact with the adjoining tooth, that will contribute greatly toward the retention of its filling.



The X Rays and Their Application to Dentistry.

By SIDNEY LANGE, M.D.

Radiographer to the Cincinnati Hospital.

Read before the Odontological Society of Cincinnati, February 28, 1908.

After I had accepted an invitation to appear before this learned society I could not but marvel at my own temerity, because my knowledge of the art of oral surgery is necessarily limited. I am in the same category with the proverbial medical student who, when asked what he would do for a patient suffering with appendicitis, answered, "I should run for a doctor."

Nevertheless I feel that medicine and dentistry have much in common, and that a knowledge of one branch necessarily implies some idea of the basic principles of the other. And I feel that in my special work I stand upon common ground, common to both dentistry and medicine.

Oral pathology does not differ from the pathology of other parts of the body, and the methods employed for one region are the methods to be used in the other. But our chief method of investigating pathology is by post mortem study. We see by post mortem examination only the end result of the disease. Pathological changes in living tissues give evidence of their presence by the perverted function of these tissues, and the chief importance of these pathological changes to us is the disturbed function which accompanies them. Dead tissues do not function, therefore the dead have no diseases. Pathology is best studied in the living. And it is my purpose this evening to call attention to a method of studying gross pathology in the *living* tissues, a method that is not a new one by any means, a method that dates back twelve years from the beginning of the Roentgen era.

The X ray may be defined as that form of radiation (energy) which emanates from a highly exhausted tube when a high tension current is sent through that tube.

Discovery of X Ray.

While the actual discovery of the ray occurred in 1895, the series of scientific events which led up to the production of the X ray dates back to 1650, when Otto Von Guericke made the first air pump. In 1838 Faraday produced the secondary or faradic current. Here we have the two essentials for the production of the X ray: an air pump to produce a vacuum and an electrical machine to generate a high tension current to send through this vacuum. Ruhmkorf, in 1851, made the first induction, or Ruhmkorf coil, the type of apparatus we use to-day

for energizing our X ray tube. Geissler, in 1859, using the Ruhmkorf coil studied the effect of passing a high tension current through a vacuum tube. But the degree of vacuum necessary for the production of the X ray was not obtained until Herman Sprengel, in 1865, invented the mercury air pump by means of which high rarefactions can be produced with comparative rapidity. Physicists now began in earnest the study of electrical discharges in rarified gases, which researches culminated in Roentgen's discovery thirty years later. Sir William Crookes, in 1875, exhausted tubes down to one millionth of an atmosphere pressure, the required degree of vacuum for the production of the X ray, and he undoubtedly produced the X ray at that time, although unaware of it. Hertz and Lenard, in 1894, showed that the rays emanated from high vacuum tubes would penetrate aluminum, but it remained for Wilhelm Conrad Roentgen to discover that the rays emanating from a high vacuum or Crookes' tube, when a high tension current is sent through it, would penetrate all things, and would affect the photographic plate.

Modern physicists are leaning more and more to the idea that all matter is ultimately made up of the same constituents; that the different forms of matter, as liquids and solids, heavy substances and light substances, owe these characteristics not to any essential difference of composition, but solely to the number, arrangement and amount of motion of the ultimate particles making up the atom, the atom being divided into smaller particles called electrons. And it is these vibrating electrons that give rise to the manifestations termed radiant energy.

A slow rate of vibration (75,000,000 per second) produces electromagnetic waves. An increase in rate produces heat waves. Another increase and light waves appear. Continued acceleration of the rate of vibration of the electrons produces successively ultra-violet or Finsen rays; then cathode or radium rays, and finally the X ray. This ray we can not perceive directly. It gives neither heat nor light, and we recognize it only by its effect upon the fluorescent screen and photographic plate. It is neither deflected, reflected nor polarized, and it penetrates all matter in inverse ratio to its mass or density.

Since these rays are so strange in penetrating all things because of their tremendously rapid vibrations and short wave lengths, and so strange that we need a sixth sense to perceive them, it follows that they should be produced in a strange manner, in a strange place. In order to excite such exquisitely rapid vibrations, all source of resistance must be removed. Therefore, we exhaust a tube to one-millionth of an atmosphere pressure. There are so few gaseous particles left in the tube that

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when a high tension current is passed through, negatively charged, electrons fly off from the cathode at a tremendous velocity (calculated to be one-third that of light), there being scarcely any resistance in this almost perfect vacuum, and, striking the anode or target, set up vibrations which Roentgen called the X ray.

Surely this is an auspicious epoch for science. The discovery of radium and its marvelous attributes by the Couries has upset our ideas concerning the entire physical universe. We find all matter unified, the universal unit being the smallest subdivision of the atom. We find the atom to be a veritable storehouse of energy waiting to be tapped. If we could but release this intra-atomic energy, steam, as a source of power, would become obsolete. We find our ideas of the conservation of energy and conservation of mass challenged, but most remarkable of all we find that alchemy is no mere dream, but a reality. The ancient alchemists have become modern chemists; the modern chemist has become an alchemist. Transmutation of radium into helium, copper into argon and lithium has been observed. We are but waiting for the transmutation of base metals into gold.

The application of the Roentgen ray to medicine

Radiographs. and surgery followed rapidly upon its discovery.

The first X ray picture of the teeth was exhibited by Professor Koenig to the Society of Physics at Frankfurt, Germany, in February, 1896, only two months after the discovery of the ray. In April, 1896, Walkof demonstrated many radiographs of the teeth. In June, 1896, seven months after discovery of the ray, an article appeared in the *Dental Cosmos* by W. J. Morton entitled "X Rays in Dentistry."

But several reasons conspired to prevent the rapid universal adoption of the Roentgen method in medicine and oral surgery which its value merits. In the first place the early machines were inefficient and the time of exposure was very long. We read of the early exposures for kidney stones lasting for one to three hours. With these lengthy exposures X ray burns were frequent, and this created a prejudice against the use of the ray. To-day no exposure need exceed thirty seconds, and in the case of children who may be frightened, or who can not be made to remain quiet, a picture may be made almost instantaneously by a single flash. An X ray burn as the result of such short exposures is entirely out of the question. The early pictures were poor and lacked definition. To-day we understand the importance of securing sharp, clear detail by the use of the so-called compression cylinder, which cuts out all the side lights.

Furthermore, many are skeptical concerning the value of the ray,

because their acquaintance with X ray pictures is confined entirely to the half-tone reproductions seen in our journals, or to lantern slides. It is a well-known fact that neither half-tone nor lantern slides do justice to X ray pictures. The original negative itself must be examined, and very carefully and in a proper light.

The great problem to-day is the correct interpretation of the X ray picture or radiograph. The technique involved in the making of the picture may be easily acquired, but the interpretation requires considerable experience. A layman may be able to prepare a pathological slide and view the same through a microscope, but the eye of the pathologist is necessary to correctly interpret the picture. An X ray picture is never wrong. If error exists it lies in the interpretation. The picture has no intrinsic value. It is of value only in the hands of one able to interpret it correctly.

We must once for all remember that a radiograph is not a photograph. As its name implies a skiagram is a shadow picture, not an image; simply a record of the varying densities of the part through which the X light has traversed. If these structures are of uniform density we get a shadow of uniform density. Since the radiograph is simply a shadow it may be altered and distorted at will by varying the position of the light. Such distortion must be considered in interpreting the negative.

When the ray traverses bone we get a shadow of the structure of that bone. Any alteration in structure is at once evident upon the plate. We thus have a means of studying, *intra vitam*, the gross pathology of bone. We can recognize upon the radiograph bone-atrophy, bone-hypertrophy, bone-inflammation, necrosis, abscess formation, sclerosis or tumor formation. So accurate is this record that few surgeons will operate upon bone or joints without first obtaining a radiograph of the part as a guide. These statements should hold true for the bones of the mouth as for bones in other parts of the body. The bones of the face are comparatively thin and very accessible. The chief difficulty is due to the fact that if the plate or film is placed externally we get a super-imposition of shadows. This may be avoided by inserting a small film within the mouth and holding it in place with the fingers. To protect the hand a ray-proof glove may be worn. Such a glove has been devised by Dr. Price, of Cleveland.

To avoid the inconvenience of holding the film in position with the fingers, I have been in the habit of taking an impression of the jaw with modeling compound, and, after hardening in cold water and trimming it, I reinsert it in the mouth with the film upon it.

**Method of Holding
Film in Place.**

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The patient, by closing the teeth upon the wax impression, holds the film firmly in position. If he moves his head slightly the film moves with it, and no blurring of the picture occurs. Only two or three teeth can be correctly shown upon each radiograph. Owing to the curvature of the jaws only the two or three teeth perpendicular to the path of the ray can be shown undistorted. It is a mistake to attempt to take the entire arch upon one film.

Protection from the Ray.

The question of protection from the harmful effects of the ray is an important one. The patient is amply protected by the modern compression apparatus, or by tube shields, but the operator who is daily exposed to this mysterious radiation should be shielded from the direct rays by a lead screen, or both. Much uncertainty exists as to just how harmful is the influence of the ray to the operator who exposes himself to minute doses day after day, and month after month. We no longer burn our hands, because we no longer hold our hands up to the tube to determine how penetrating the rays are. There are many other ways of determining the penetrating power of the tube, which, because of their technical nature, I will omit.

Outside of such a burn to the hand the only tangible injury which the Roentgen operator may sustain is sterility. It has been experimentally proven that an exposure of forty minutes to the testicles of the guinea pig destroys the germinal epithelium, which results in azospermia, an absence of spermatozoa from the semen. This has been observed in many X ray operators. The sterility is not accompanied by any change in the sexual function, and may again disappear if the proper protective measures are observed, providing the atrophy of the germinal epithelium has not proceeded too far. Just why the testicles should be so affected is probably because of their superficial position, and because of the delicacy of the germinal epithelium. Whether the X ray operator will suffer serious damage to other parts of the body, time alone can tell; therefore, it is a part of wisdom to exercise due caution, knowing as we do the profound influence of the ray upon both cell structure and cell activity.

The Fluoroscope.

The value of the fluoroscope, or fluorescent screen, has been largely overestimated in the past, and to its indiscriminate use many of the early errors in X ray work may be directly traced. The image produced upon the fluorescent screen is hazy and indistinct, and not at all comparable to the fine quality and detail of the picture which is obtained by the photographic method. Good fluoroscopes are difficult to obtain and very expensive, and all of them deteriorate rapidly from the effect of heat

and the X light. Furthermore, in using the fluoroscope we are exposing ourselves and our patients to unnecessary danger. A picture may be made in five seconds, but if we use the fluoroscope we are tempted to expose ourselves ten or fifteen minutes, or longer. For the above reasons I never use the fluoroscope except to examine the chest, where it is desired to study the motile phenomena of the thoracic viscera, such as the pulsation of an aneurysm, the extent of the excursion of the diaphragm, etc., and I do not believe that the fluoroscope has any place in dentistry.

The application then of the X ray to dentistry depends upon the fact that substances of different densities are unequally transparent to the X ray. Thus metallic fillings appear as black masses; the root fillings as somewhat less dense streaks; the enamel and dentin are next in density; while the root canal shows plainly as a light channel in the dentin, and the alveolar process and maxillæ show their fine uniform cancellous structure in various degrees of density depending upon their thickness. The entire field from the crown of the tooth to the base of the alveolus can thus be minutely studied.

The simplest application of the ray is for the detection of unerupted, impacted and supernumerary teeth. We have in these subtle rays a means of studying dentition from its beginning in the sixth week of fetal life to its completion in the twenty-first year. We can detect the formation and gradual growth of the enamel germ, which finally enlarges to form the crown. Then the point-like projections appear (the primitive roots), which gradually elongate and enclose the root canals.

In studying the plates which I will show this evening it occurred to me that abnormalities in the second dentition might be foretold before they appear by a study of the unerupted teeth in the child's jaw. I wondered, if by a Roentgen examination during some of the acute infections of childhood, we could detect disease or destruction of the unerupted tooth-germ, and thus predict an absence or a malformation of one or more of the permanent teeth. From a hasty survey of the literature I do not believe that a systematic X ray study of the child's jaw has been recorded. In the *Journal of the New York Institute of Stomatology* (December, 1906), Tousey attempts to establish the value of the X ray study of unerupted teeth by radiographing one hundred children, and measuring with accurate calipers the breadth of the crowns of the unerupted teeth. He infers that the size of the unerupted crowns will give some idea as to whether there is sufficient space in the free border

of the alveolus for their eruption, and calls attention to the fact that a very small deciduous tooth may be followed by a very large permanent one, and *vice versa*. But Tousey fails to take into consideration that the alveolar arch is constantly enlarging during this period to make room for these larger teeth. By accurate measurements he shows also that the size of the teeth upon the radiograph corresponds very closely with the actual size of the teeth, the enlargement upon the radiograph being inappreciable.

**Impacted
Third Molars.**

Interest in connection with non-erupted and impacted teeth centers about the third molar because of the great frequency of this complication. Kells reports a case of four impacted molars in the same patient. There is much literature extant concerning the diagnosis and treatment of an impacted third molar. In the older text books the student is instructed to "probe with sharp steel points, and thereby get the location and character of the tooth." But these teeth are often covered by dense bone. The removal of the second molar is sometimes counseled in the treatment of this condition; in some cases the removal of both second and third molar. Cryer states that an impacted molar often causes great distress by initiating inflammation, which often includes the temporo-maxillary joints and the soft parts of the mouth, preventing mastication and deglutition, and one of two things must be done, either the offending tooth, or the one in front of it, must be removed. Kells insists that such symptoms do not occur in a *young* individual, but can only result from *continued* pressure of the impacted tooth over a *considerable period* of time, and he, therefore, concludes that an impacted third molar should be diagnosed by a radiograph in its *early eruptive* stage, and removed without delay. Such a picture will safeguard the possibility of leaving a small piece of root in the alveolus to cause trouble at a future time. Aside from showing the presence and position of such abnormally placed teeth, the X ray will influence the treatment of the condition by showing the exact nature of the roots of these teeth and the direction in which they point. In connection with unerupted teeth a short-coming in the Roentgen method of examination has been met with. The X ray picture is a flat surface, *i. e.*, it shows the relations of the teeth in only two dimensions. In other words, having located an impacted tooth it is impossible from the picture to say whether the tooth lies nearer the lingual or the buccal surface of the alveolus, a point which may have a bearing upon the subsequent treatment. A stereoscopic picture which supplies the third dimension has been recommended to overcome this difficulty.

X Ray in Orthodontia.

In orthodontia the value of the ray can hardly be overestimated, for it gives the operator a survey of the field in which he is to work, and he can draw his plans according to the conditions found. It will show the presence and position of unerupted teeth, or it will register their absence. It will show the length and direction of the roots of the teeth and the amount of space between them. It will show whether the root is only partially developed and opened at its tip, or it will show the root to be fully formed with a small apical foramen, a point which may influence the subsequent corrective procedure. It will settle the question as to whether a tooth is permanent or deciduous; it likewise will show the extent of absorption of the deciduous root.

X Ray Examination of Tooth Roots.

Of next importance from the X ray standpoint is the study of tooth roots. You will note upon study of radiographs of normal teeth that the root is smooth in contour, although grossly it may be variously curved, that the cancellated alveolus hugs the tooth closely, and that the bone structure between and above the teeth is uniformly mottled or stippled. A pericementitis is evidenced by a light space between the root surface and the alveolus. Abscesses about the tip of the root, or in the alveolus, are likewise recognized by light spaces in which no cancellous structure can be made out. How often do you have evidence of abscess without being able to localize same, or to recognize the offending tooth? Even though a sinus exists it may be impossible to trace its origin. As absolutely typical of this class of cases I have taken the liberty to quote from Schamberg the following clinical history:

"Radiograph No. 11 shows an incipient abscess upon the root of a crowned bicuspid tooth. Prior to taking the picture there was no definite means of determining which tooth was at fault, for all the teeth in the vicinity were equally tender, and there was no evidence upon the gum of the trouble that was ensuing within the alveolar process. The patient was almost frantic with pain. Upon examination of the X ray negative it was noted that the area of tissue destruction was small and located at the end of the bicuspid root, the canals of which were well filled. The patient was placed under nitrous oxid, and an opening through the gum and alveolus was made, and the abscessed area curetted. Relief from pain was immediate and the healing prompt." He adds further, "It has become an invariable rule with me to take a radiograph of every chronic abscess before performing the operation, and occasionally I take a second or third radiograph to note the progress of the case." It occurred to me on reading Schamberg's article that even though the abscess be located, an X ray picture would be serviceable in showing whether the root was involved or whether the trouble was con-

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fined to the alveolar tissue, and consequently might indicate whether the condition could be treated through the pulp canal or whether through the alveolus, and if through the alveolus whether a simple curettage would suffice, or whether apical excision would be necessary to eradicate the infection. Furthermore, if excision of the root be decided upon, the radiograph might show how much of the root to remove. In those cases in which the pus has burrowed through the tissues and finally discharged some distance from the original site of the infection, the resulting sinus may be tracked to its origin by injecting into it an emulsion of bismuth-subnitrate (an inert powder), and then radiographing. This method has proven valuable to me in other regions of the body.

X Ray in Prosthodontia.

In a general way the strength of a tooth can be estimated from a radiograph of its root. Such a knowledge would be of value in determining the position of anchorage for bridge work, or in placing crowns. Kells recommends placing lead or platinum pins in position, and then radiographing in order to determine whether they are the proper length. Since absorption of roots may occur from disease, or even idiopathically, the integrity of a tooth can be ascertained by a radiograph before undertaking corrective or operative measures of any sort. Mechanical strength of a tooth depends for the most part upon the health of its root and surrounding alveolus, but it is possible that such physical characteristics as shape and length of root may indicate the strength of the tooth.

Root Fillings.

Inspection of root canals and root fillings can be easily carried out by the Roentgen method. Broken off instruments or foreign bodies may, of course, be easily located. Because of fused, bifurcated or curved roots, the root filling often fails to reach the tip.

Lewis has shown that ordinary root fillings, gutta-percha or chlora-percha show plainly upon the radiograph even to the tip of the smallest root canal. In the *Dental Review* of July, 1906, he says, "In 90 per cent. of cases of abscess that I have radiographed, improper and short root fillings have been apparently the direct cause, and the radiograph has shown the apex of the root to be unfilled." Except with the X ray one can not always tell with certainty the direction or the thickness of a root, and therefore the enlargement of a root canal should be very carefully proceeded with. In the cases I have seen, curvature of roots has been not the exception, but the rule, and enlargement of such canals, with the so-called Gates-Glidden drill, seemed mechanically impossible. The radiograph will, of course, show a perforation of the root by such a drill. Would it be perhaps ultra-scientific to suggest the aid of the radiograph in all operations upon root canal?

In the various manipulations upon the root canal the dental surgeon is working more or less in the dark. In cleaning out such a root canal, owing to the varying shapes and lengths of the roots, it may be impossible to determine whether or not the apex of the root has been reached. By inserting a fine brooch and radiographing the tooth with brooch in position, this point may be cleared up. In drilling out a root for the insertion of a pin, or post for an anchorage, this same procedure will tell whether you are drilling in the right direction, and whether deep enough or not.

I quote the following case verbatim from Kells in *Dental Review*:

"A patient presented himself with sore lower bicuspid, which contained large defective filling. He stated that the tooth had been filled five years ago, and that it had caused pain occasionally since then. According to rule all such cases are immediately radiographed that no valuable time may be wasted, and the method of treatment is determined upon only after the conditions within the root and its apex are learned. The picture showed a root filling extending only one-half the length of the tooth, the lower half being devoid of any filling whatever. A pus pocket was shown at the end of root, and upon its mesial aspect. Upon removing the filling considerable blood and pus exuded. Patient stated that the dentist had previously used a drill in root. A lead post was inserted, and the patient was again radiographed, and the picture showed that the root had been drilled through."

Fillings which encroach upon or enter the live pulp cavity may be the exciting cause of much local disturbance and reflex pain. A radiograph may aid in clearing up such obscure cases. With regard to pulp stones Tousey claims to be able to show them upon the skiagraph, although Saterlee has never been able to demonstrate them. Lewis claims that pulp nodules can be shown by regulating the tube vacuum to suit the part to be skia-graphed. The refinement of technique that makes such diagnoses possible is the result of the improvement of X ray apparatus in the last few years, and the study given to this work by Roentgen specialists.

Exostoses of roots, necrosis and tumors of the maxillæ, fractures of the maxillæ and dentigerous cysts, all come in the field of Roentgen diagnosis. Dr. Case reports the recognition, by means of a radiograph, of an odontoma which prevented the eruption of a permanent tooth.

An enumeration of the applications of the Roentgen ray would not be complete without a reference to pyorrhea alveolaris. My personal experience with this obstinate condition is extremely

**X Ray in
Pyorrhea Treatment.**

limited, and what I shall say concerning it represents simply what I gather from a brief review of the literature and from conversations

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with various members of this society. There seems to be some difference of opinions as to whether or not the X ray can be applied to this condition for diagnostic purposes. But since we know that this disease is associated with absorption of the alveolar processes, with pus pockets about the roots of the teeth, with necrosis of roots, with alveolar abscesses and with deposits about the teeth, all of which lesions can be demonstrated upon the radiograph, the ray would seem to have an important bearing here, not for purposes of diagnosis entirely, for the disease is usually self-evident, but rather as an indication for relief of the condition. For the radiograph will show just how advanced the disease may be, will show the location of the pus pockets, the necrosed roots and the deposits about the teeth. The question as to whether the ray can show the deposit and excrescences about the roots has been much discussed.

Dr. Rhein made the following assertion before the National Dental Association: "It is impossible for any deposits to be on the teeth that the radiograph will not show." Tousey corroborates this statement. Schamberg, on the other hand, says that the deposits can not be detected. He adds, moreover, that the deposits upon the roots of teeth are frequently so minute that they are scarcely perceptible to the eye, even after they are removed, and still they are a source of irritation. That deposits of some size upon the roots of teeth will show, I can prove by a lantern-slide of some extracted teeth as well as by a case of pyorrhea. But even if they are too small to show upon the radiograph, the little pus pocket which results from their irritation will be indicated upon the radiograph, for there will be a small space between the alveolus and the tooth root at the site of the deposit, while normally the alveolus hugs the tooth root closely everywhere.

Dr. Rhein intimates that the ray may be used even in the differential diagnosis of pyorrhea, and he cites three instances, all of which I shall quote.

The first was an experimental examination of a dead monkey. Regarding this case he says: "The director of the Rockefeller Institute in New York called my attention to the great amount of calculus deposit about the teeth of a monkey which had died at the institute, and I thought we had a good case of pyorrhea, so I turned the specimen over to Professor Bromwell, and to our astonishment we found a normal alveolus. This illustrates what happens so frequently in practice" (I am still quoting Dr. Rhein) "where we see many cases in which the deposits are simply the localized expression of a constitutional disorder."

The second instance given by Dr. Rhein is as follows: A patient with a loose bicuspid was referred to Dr. Rhein as a case of pyorrhea,

which demanded attention. The radiograph, while it shows an absolutely healthy condition of the osseous structure, presented one pathological point, namely, that inflammation of the pericementum had existed, and that the looseness of this bicuspid was entirely due to local irritation brought about by a badly made gold shell crown, the exciting cause of the inflammation in the peridental membrane. The removal of the pulp and the proper crowning of the tooth effectually cured the case.

Case three was a case "in which there was a loose lower third molar with deposits and pus, a type of case that a large portion of the profession would take for a pyorrheal case pure and simple. The X ray picture revealed an amalgam filling entering the pulp cavity with no sign of the pulp ever having been treated. It was simply a case where the exciting cause was an improperly inserted amalgam filling which had caused the death of the pulp.

Of the therapeutic application of the ray to pyorrhea much has been written, and I mention this phase of the subject simply to open the way for a discussion of the same. My experience with the ray in similar medical conditions would lead me to believe that it might be of value in the treatment of pyorrhea, not as a specific, but rather as an aid to other means of treatment.

At the Cincinnati Hospital we are using the ray to stimulate slow suppurative conditions, such as indolent leg ulcers, suppurating glands, chronic eczema, etc. That the ray is not bactericidal, *per se*, is well established, but it does seem to favorably affect such indolent infections by stimulating the cells to react against the infection rather than by killing the germs. Favorable reports have been recorded by various men, unfavorable reports by others. Since the X ray treatment of pyorrhea is at best only an adjuvant to other methods of treatment, its real value is perhaps hard to establish. It is true in medical work, and undoubtedly true also in dental work, that when we have exhausted all the ordinary drugs and remedial measures we resort to the X ray, and in just such types of cases of indolent suppurative processes the X ray seems to benefit probably entirely through its stimulating effect.

The X ray has a bearing even upon the extraction of teeth, in so far as it will show the size and direction of the roots of the tooth, or it may show the absence of the germ of the tooth which is expected to take the place of the one to be extracted. Lewis says: "The dentist has a great advantage over the physician in that by means of the X ray he can hold as good a post-mortem examination before extraction of the tooth as after, and he can profit by the knowledge so gained."

**Reflex Lesions
Detected by X Ray.**

Its bearing upon obscure neuralgia is an important one, since we know that pain due to abscessed, impacted or misplaced teeth may be referred to any branch of the fifth nerve. Irritation of such teeth may be a factor even in the various mental disturbances. Just a few days ago a well-known ear, nose and throat specialist referred to me a case of pain behind the ear and over the mastoid cells, the cause for which the most painstaking examination of the ear would not reveal. A picture showed a misplaced third molar, the removal of which, I am informed, has relieved the condition.

Two cases of alopecia recently reported in a French journal were traced directly to the teeth, one caused by a retained root after extraction of the tooth, and the other by an abscessed tooth. The radiograph would have cleared up both conditions. Before undertaking any of the severer operations for the relief of intractable neuralgia, such as extraction of the nerve root or ganglion, an X ray examination of the teeth is indicated to exclude peripheral irritation by the teeth. We are told that a tooth otherwise normal in position may have one of its roots pressing upon the dental canal. This I found difficult to diagnosticate from the radiograph, because the picture is flat, and if a root appears superimposed upon the dental canal we can not say whether it is placed to the buccal or lingual side of the canal. Likewise in interpreting radiographs, we must remember that we are viewing only the mesial and distal contours of the tooth, and that deposits or an abscess either on the root or in the alveolus, *i. e.*, to the lingual or buccal side of the tooth, may be overlooked because of the heavy shadow of the tooth which is superimposed upon the abscess or deposit. Likewise a root which is curving in a buccal or lingual direction may look perfectly straight (although shortened) upon the radiograph.

Examinations of the Sinuses.

It remains to speak briefly of the value of the ray in examination of the pneumatic sinuses of the face. By a method first used in Germany and later worked out in this country by Caldwell, of New York, the antrum, ethmoids and frontal sinuses can be outlined upon the radiograph. The size, shape and position of these cavities can be ascertained, and the relation of the teeth to these cavities can be established. Accumulations of pus in these cavities can usually be shown. The importance of the roots of the teeth, as an etiological factor in antral infection, has been frequently brought out. In reviewing the relation of the teeth to the maxillary sinus, we are reminded that the floor of the sinus is situated over the superior molar and premolar teeth, and may descend between the roots. The roots of the superior teeth may extend so far upward as to form an uneven outline on the floor of the antrum, or

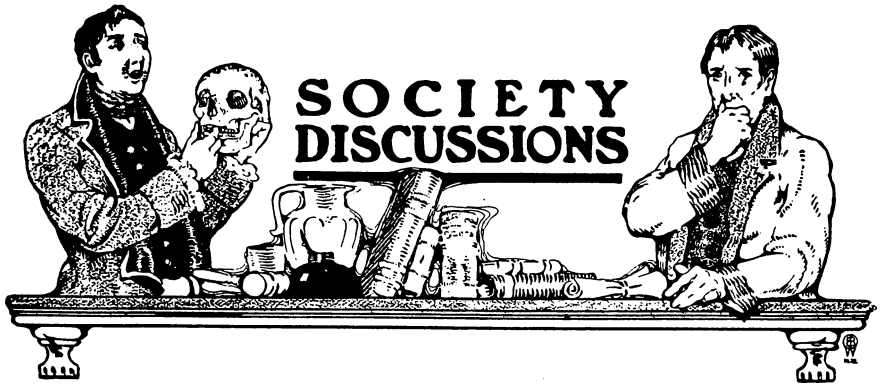
in some cases the floor of the antrum may be absent over these teeth, leaving only the muco-periosteum covering over the ends of the root. A properly executed radiograph should include the floor of the antrum, and should, therefore, reveal such conditions. A diseased root may readily be the cause of empyema of the antrum, likewise a diseased antrum can secondarily infect a root which projects into it. But whether the root involvement is primary or secondary, of this much we are certain, that as long as the diseased root remains the antral infection will not subside. Therefore, nose and throat specialists will have occasion to resort to dental radiography to locate such an offending tooth. In determining where to drain an antrum, since drainage is most perfect if we tap the cavity at its lowest point, the radiograph should play a part in such procedures. While the teeth are related anatomically only to the antrum of Highmore, the ethmoid, sphenoid and frontal sinuses are so closely connected with the antrum that it has been said that infection for one sinus means infection for all. Hence the importance of the teeth in *all* sinus infections.

Dr. Fossume, in the *Journal of the American Medical Association*, reports the following interesting case:

"A man about sixty years of age complained of a pain on left side of his face, especially at night. His family physician sent him to a rhinologist, who treated the post nares, as there was considerable discharge from the nose. As the last molar was particularly sensitive to percussion the patient consulted Dr. Fossume, who tested the molar, and found it normal. He then had a radiograph made. This demonstrated a small tooth located immediately in front of the sensitive tooth, which had remained *in situ* fifteen years. This root piece was removed, and, as it encroached upon the antrum, this cavity was opened in its extraction, a free flow of pus ensuing from the maxillary antrum. The case healed in three weeks."

Cryer's interesting work upon the congenital abnormalities in the size, shape and position of the antrum, ethmoid cells and frontal sinuses suggested to me the possible value of the ray in the recognition of such variation from the normal. His X ray study of the temporo-maxillary joint is interesting in this connection.

I trust that in this review of the application of the X ray, I have not been over optimistic, although I will readily plead guilty to an excessive enthusiasm in this line of work, an enthusiasm which often routs conservatism. I trust further that you will not deal too harshly with such inaccuracies as must creep into a paper when one is wandering in strange fields.



Central Dental Association of Northern New Jersey.

March Meeting.

A meeting of the Central Dental Association of Northern New Jersey was held at Davis's parlors, Newark, N. J., on Monday, March 16, 1908. President Hane called the meeting to order.

A quorum being present, on motion the rollcall was dispensed with.

The secretary read the minutes of the last meeting, which were on motion approved as read.

Dr. Fowler brought up the subject of reorganization of local and state societies. He read a synopsis of the Illinois plan and presented the following motion:

"That a committee be appointed to prepare a constitution and by-laws, working in conjunction with the committee of the State society, which constitution and by-laws might be presented at the meeting of the State society in July next."

The above motion was regularly seconded and adopted.

Dr. Morrison, of Nebraska, at the invitation of the president, addressed the society on the subject of "Dental Society Reorganizations."

The president appointed as a committee, under Dr. Fowler's motion, Drs. Fowler (chairman), Watkins, Sutphen and Brinkman.

Dr. Sutphen called the attention of the society to the provisions of a bill concerning the sale of cocaine, etc., at present pending before the New Jersey State Legislature, and moved that the secretary of this association be authorized to write to Assemblyman William P. Martin, of Essex County, to the effect that the C. D. A. fully recognizes the value of this bill and endorses the same with the request that after the words "practicing physician," appearing in Article I of said bill, the words "practicing dentists" be inserted. Resolution adopted.

Dr. Brinkman, of the Committee on Bad Debts, reported as follows:

**Plan to Avoid
Bad Debts.**

Your committee, to whom was referred the question of the avoidance of bad accounts, begs to report that it has had several conferences, and the result of its meetings is as follows:

"Your committee finds that there is within this State, as probably within all others, a number of persons who are in the habit of exhausting their credit in one community and then moving to some other, where they seek credit as long as the creditors will stand it, and then, without payment of bills, go to some other place and repeat their operation. Furthermore, your committee has ascertained, and this without much difficulty, that there are a number of persons permanently resident in various communities who do not pay their bills, if they can possibly avoid it, and the following plan has been suggested as affording some means of protection to the dental profession against persons of this ilk:

"That each dentist throughout the State prepare a list of persons who are unworthy of credit, and that this list be sent to some person, whose duty it shall be to make a list of all these names, and send them to every dental practitioner throughout the State subscribing to the plan, so that he may be warned against bad debtors. In order to do this, it will be necessary to create either some kind of an organization, or appoint some person to handle the matter. Your committee has conferred with Mr. Herbert W. Knight, whom most of this society know, and who is a counsellor at law, having offices in this city, and he has expressed his willingness to canvass the dental profession of this State, and ascertain whether a sufficient number of its members would be willing to enter into said plan, paying their proportionate share of the expenses thereof.

"Mr. Knight thinks that, provided a sufficient number express their willingness to enter into the scheme, the expense per capita should not be more than five dollars per year, which expense might be lessened if the scheme were a success, and the addition of new subscribers warranted it.

"Your committee, therefore, recommend that Mr. Knight be authorized to make such a canvass of the State as above suggested, and to put this plan into operation if it is found practicable to do so.

"The above is to be done without any expense to this society.

H. PARKER MARSHALL,
M. R. BRINKMAN."

March 16, 1908.

On motion the above report was adopted.

Dr. Meeker called the attention of the meeting to the dinner to be given to Dr. Farrar in New York on Saturday evening, the 21st of March, and invited the members to attend.

Dr. Luckey then addressed the meeting on the subject of Assembly Bill No. 91, an act at present before the Legislature exempting dentists from jury duty. Dr. Luckey stated that the bill had passed the House, and was at present before the Senate, and asked that every member of the association communicate with the Senator from his county, asking favorable action upon the bill.

The president then introduced Dr. Thaddeus P. Hyatt, of Brooklyn, N. Y., who delivered a lecture which follows:

Ancient and Modern Dentistry, and Care of the Teeth.

By THADDEUS P. HYATT, D.D.S., Brooklyn, N. Y.

Some six or seven years ago I brought up the subject of the education of the people in dentistry, before the Second District Dental Society. I feel that the public ought to be educated, and to-day I feel, and believe that all dentists feel, that it is far better to work for an educated person than an ignorant one. An educated person, realizing the importance of our service, is better able to appreciate what is done for him. Our service to them, our relations with them, and the position of our profession, all stand on a very much higher plane with those who understand the benefits and importance of dentistry. To-day the dental profession realizes the importance of educating the public, and I have been in correspondence with dentists all over the country upon this subject. The general public suffers from a deplorable condition of their teeth.

An examination of the teeth of the children in the Brooklyn public schools showed that among 559 children, only thirteen did not need dental attention. All of the children who needed attention were sickly, pale and emaciated. When some of them were asked if they used a toothbrush they did not even know what a toothbrush is. One little girl, whose teeth were in a fearful condition, said that she did use a toothbrush, but she added, "It is awful soft when it comes to me, for my father and mother and two sisters use it before I get it." Such a condition as that reflects upon us as a profession. If our code of ethics

**Examination of
School Children.**

means anything at all, it should be a living reality. We are in a position to instruct the public. Our degree of "doctor" is given that we may teach, and if we want to be something more than mere toothfillers, pluggers of cavities with gold and silver, porcelain or cement, we must educate the public mentally as well as operate for them physically.

The lecture I propose to deliver to-night is one that I have been giving in the public schools for the past three years. I make no apologies for what it is, but simply ask you to realize that I had no precedents to follow. I am giving this lecture before you this evening in answer to the question, "Hyatt, what do you say to the people?" The reason so many dentists have not been enthusiastic about lecturing before the public is because they have wondered how the subject could be presented. This evening you must place yourself in the position of the layman, while I must try and forget that you are professional men, and talk to you as though you knew nothing about the subject.

With this preface I will ask you to imagine that the gentleman who opens the public school meeting is present, has announced to the audience the subject that is to be presented at the next meeting and then introduces "Dr. Hyatt, who will speak to you upon Ancient and Modern Dentistry and Care of the Teeth."

**Example of Lecture
before a
Public School.**

"My friends, I wish before the illustrations are shown to preface my lecture with a few remarks.

"No science and no art during the past fifty years has made such wonderful and interesting advances as has the art of dentistry. Most important discoveries have been made during the past twenty-five to thirty years, showing the importance of the condition of the teeth to the health of the whole body, and how the intellectual, as well as the physical welfare of men, women and children depend upon good teeth and a clean mouth. In olden days dentistry had a good deal of quackery connected with it, as had medicine, and while I shall not go deeply into the details of ancient dentistry I shall show you a few illustrations in order to make a comparison and show how dentistry has progressed. During my lecture there will be shown a series of slides illustrating the development of the teeth; really and truly the most wonderful development of any part of the body. While nature has supplied you with one pair of eyes, one nose, one pair of ears, and with but one pair of hands or feet to last you your entire life, the teeth are so important that nature has taken the precaution of giving you a temporary set of teeth, called "baby teeth," to be used until she has been able to perfect, in exquisite beauty and material, the second set, which, with proper care, should serve you all the days of your life."

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Stereopticon slides were used to illustrate ancient and modern methods, and the instruments used in dentistry. The essayist took for his text, "A Clean Tooth Never Decays," and went very earnestly into the subject of prophylactics. In showing the development of instrumentation there was exhibited an illustration of a dental engine which ran by clockwork, which was invented by an Englishman about two years before the production of the American dental engine. Slides were used showing the production of artificial teeth as practiced long ago; and whole sets of teeth carved from one piece of ivory or the tusk of the hippopotamus. Illustrations of specimens of ancient bridge work, where the artificial teeth were made from this same material, were shown. Dr. Hyatt also brought out the fact that Dr. Wells discovered the practical use of anesthesia in dentistry, and related the incident of how Dr. Colton was giving a public exhibition of laughing gas, when one of his subjects under the influence of the gas stumbled, hurting his leg quite badly, but was quite unconscious of the injury, which gave Dr. Wells the idea of the use of this anesthetic in dentistry.

Dr. Hyatt called the attention of his audience to the fact that dental operations are not confined to the human mouth, and related the incident of the formation of an abscess in the tusk cavity of the elephant Jumbo. At some period Jumbo's tusks were broken off and the flesh grew over the broken ends. The tusks still growing caused an abscess to form. With great difficulty, and not without danger, this abscess was lanced and relief given to the animal. Subsequently an abscess formed in front of the other tusk, and when the same person, who had lanced the former abscess, came to Jumbo's quarters in the Zoological Gardens, London, Jumbo voluntarily approached and, turning the side of his head with the abscess to the operator, stood perfectly still while the operation was performed. Dr. Hyatt said:

"This is an example you all might well learn. As a rule, no matter how much relief a dentist may give in the extraction of a tooth, or the lancing of an abscess, the patient invariably makes a fuss when the operation is required to be performed at some other time. Surely an elephant should not have more intelligence than you people."

Dr. Hyatt then demonstrated the usefulness of the X ray in dentistry.

There were then exhibited a number of slides showing the development of the temporary and permanent teeth; and on the subject of the suffering of infants Dr. Hyatt said:

"Do not allow any child of yours, suffering from swollen gums, to continue with it. Go to a dentist and let him lance those gums so that

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these teeth may come through. No child needs to suffer such pain. A lance quickly cutting the gum will relieve all pressure and the pain will stop."

There were then exhibited a number of slides showing the anatomy of the human teeth and the location of the pulp and various other parts thereof, explaining the relation of one part to the other, and illustrating how nutrition is supplied thereto.

Another slide illustrated the various nerves connected with the teeth, and showed how these nerves all come together in the posterior part of the head, and are connected with nerves associated with the functions of the eyes, nose, ears, etc.; and explained how many cases of blindness, deafness, together with nervous and spasmodic contractions of the throat, have been traced to decayed and unhealthy conditions of the dental organs. Other slides illustrated the advances made in orthodontia.

At this point Dr. Hyatt went quite deeply into the subject of the importance of keeping the mouth and teeth clean, and showed how decay is caused by the retention of parts of food between the teeth, and explained how this food decomposes and forms cultures for bacilli, which eventually result in the decay of the teeth. Dr. Hyatt recommended his hearers to clean the teeth thoroughly at night, using floss silk in the spaces between the teeth, tooth powder for the teeth and rinsing thoroughly with cold water, and in the morning rinsing out the mouth. He exhibited a form of toothbrush which he recommended, and instructed his audience how to properly clean the teeth. He said the cleanest mouth he had ever seen was the case of a man who not only cleaned his teeth as above suggested, but every morning scraped his tongue with a thin piece of whalebone, "and," said Dr. Hyatt, "you will be surprised how often you will scrape off some of that dark-brown taste."

Continuing his lecture, Dr. Hyatt said:

"A great many people come to me at the public lectures and ask what is a proper price to pay for dental services. My reply is, 'If I have been able to impress upon you, through this series of pictures, the value and importance of the teeth, then you must realize you are placing in the hands of a man a part of your body that he may operate and work upon it; he can do things there of which you are ignorant, and you do not know whether he is doing the right or wrong thing. If you have sufficient confidence to allow him to operate on your teeth, when he can cheat you if he wants to, and you can not tell if he does, then, for heaven's sake, have enough confidence in him to hand him your pocket-book, knowing he will only take the amount he is justly entitled to. New

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dollars and cents you can secure again; your teeth never. If you imagine his fees will be large there is always a way in which that subject can be approached. I have yet to hear of the professional man who is not willing and glad to meet his patients more than half way upon this question. Say to him frankly that you have no idea how much work you need and would be glad to have an approximate idea of what it will cost. Ask him to name two sums, one that it can not cost less than, and one that it will not cost more than, and you may be sure he will use every effort to keep the cost within the sums named. If you can not pay him in a lump sum, say so, and every dentist I know of will be willing to let you pay so much down and so much at another time at your convenience.'

"There is just one more word I want to say: To-day we are greatly concerned with the hygiene of pure food, and Congress has passed laws to insure this. But what is the use of pure, nutritious and healthy food if one's mouth is full of decayed teeth? Let me give you an illustration, one that may shock the ladies present, but it is so true that you should hear it: Dr. Godey, of England, in addressing a body of surgeons—not dentists, but surgeons—said, 'Gentlemen, you would not allow your patients to apply their lips to a running ulcer on the arm and suck it and clean it in that way, and yet, if you do not pay attention to the mouth and teeth of your patient, he may be doing something that is worse. Decayed bone or tooth substance is more poisonous and irritating to the mucous membranes than is the matter which comes from a running ulcer, and your patients with neglected teeth are swallowing this decayed bone all the time.' Children that take clean and healthy food prepared by their parents in clean utensils, and yet have in their mouth decayed and broken down teeth, are taking into their stomach material more filthy and more harmful than if they should go out into the street and eat garbage out of the garbage barrel."

In conclusion Dr. Hyatt recommended his hearers to go to a dentist at least once in six months to have the teeth examined, and said, "If I can impress upon your mind this one sentence I shall be satisfied, '*A clean tooth never decays.*'"

Discussion of Dr. Hyatt's Lecture.

Dr. W. P. Richards. I am wholly in favor of the education of the public through the public schools in the subject of dentistry.

Dr. Sutphen. I enjoyed very much indeed the lecture of Dr. Hyatt. I think we are all very much indebted to him for what he has shown us to-night. It is cer-



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tainly a very important subject, and is the leading topic in the dental profession to-day—keeping the mouth clean. If we can succeed in doing that it is my firm belief that, as he has so beautifully shown us, we will have no decay—and an ounce of prevention is always better than a pound of cure. Let us get at the foundation and prevent the trouble.

Dr. Hyatt is to be commended for the persistency he has shown under such great disadvantages, and for persevering until this lecture was perfected and has been given successfully so many times and with an amount of good that is incalculable.

Dr. Gaylord,
New York.

I believe the essayist has struck the nail squarely on the head and has started on a mission which will bring about a result that is bound to come. I believe that dentistry in the future is to be preventive dentistry, and that the dentist of the future will prevent decay instead of filling holes. The profession, as a body, is extremely slow to take up that idea, and I doubt very much whether it will be adopted by the profession until the public demands it, but the essayist is working along a line which will cause the public to demand that kind of work.

I wish to thank the doctor for the entertainment I have received, and to commend him for his very pleasant manner of treating the subject. Of course, in his lectures he is addressing people entirely ignorant of the subject, and has to adapt himself and his address to their understanding, and I am sure he has most beautifully done it. He has selected his phraseology and his statements in such a way that they are catching, and his lecture as a whole is very enjoyable.

I want to thank Dr. Hyatt for coming here this evening, and if he were practicing in New Jersey and were a member of this association, there would be fewer dental fakirs in the cities of this State than there are at the present moment.

We must educate the general public to what true dentistry is, and the more we can get them to go to ethical men the better for our standing as a profession for our relations to the medical fraternity and for our pocketbooks.

The campaign which has been carried on in that direction has already shown results in this State, for there are fewer dental parlors in New Jersey than there were some years ago, and I only wish that Dr. Hyatt would come to New Jersey and practice and carry on his good work throughout this State.

Dr. Hyatt.

I appreciate very much the remarks that have been made, and it is very gratifying to see that the dental profession is becoming interested in this subject.



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The Harvard Odontological Society has requested me to give the lecture at Boston, and I am to give it before the New York Institute of Dental Technique on Tuesday of next week.

In Brooklyn they have taken up the work so earnestly that there are some ten men giving this lecture—practically along the same lines—in the different branches of the Y. M. C. A., and before children. When I deliver this lecture before children I call it “Jumbo’s tooth and other teeth.” The gratifying part is, that in speaking to boys between eight and twelve years of age we find these little fellows are just as interested as you men are; they listen with rapt attention. Many of the secretaries of the different organizations have written me, saying that the little boys have been so interested that they have asked a number of questions about the teeth, and have bought toothbrushes, and started to clean their teeth. If you will take up this work you can have a lecture given in each of the public schools of this city to the children. We are advocating in New York that one lecture should be given each year in every public school for the children. It makes a great impression on their minds, especially with the pictures, and it becomes a part of their lives, and it will always be found very easy to interest them.

On motion adjourned.

April Meeting.

A regular monthly meeting of the Central Dental Association of Northern New Jersey was held at Davis’s parlors, Newark, N. J., on Monday, April 20, 1908. President Hane called the meeting to order.

On motion, a quorum being present, the calling of the roll was omitted.

On motion, duly seconded and by the affirmative vote of all present, all matters of business were ordered dispensed with except receiving of proposals for membership and the election of new members.

Dr. Van Woert, of Brooklyn, read the essay of the evening.

Discussion of Dr. Van Woert’s Paper.

Dr. Schmitt asked Dr. Van Woert and myself
Dr. Ottolengui. to-night if we had ever found it necessary to drill through an inlay, in order to remove a pulp, which had died after the inlay was made. I have had that experience, and if any of you ever have it, you will see the advantage of what I will suggest

to you now, which is something I have done ever since my one experience. Remember you not only have the hard gold to drill through, quite a little quantity of it, but you usually also have a sore tooth to deal with. Consequently, nowadays, after making a wax inlay over a pulp which is not fully exposed, I find that by using Taggart wax, without any danger of distortion at all—of course being careful not to keep the instrument cool, I can cut a deep groove or hollow on the under side of the wax with a new sharp bur. For instance, if I were to put in a filling of the character illustrated in Fig. 1, before casting that wax inlay I take a bur and cut a hollow at the place which will fit immediately over the top of the pulp canal; this not only gives me a cap over the pulp but lessens the distance I should have to drill, if it were ever necessary to enter the pulp afterward.

Here is an idea I want to give you about the cast gold inlay and why it is that the cavity preparation differs with a cast gold inlay from that for other gold inlays.

The great trouble with the older methods of making gold inlays was that in a great many cases they came out, even when made by a good operator, so that to a great extent they were limited to cavities which had a more or less good retaining shape to them, and the reason for that was that the inlay which was made in the matrix compelled a cavity shape which would enable one to withdraw the matrix without distortion. You can not burnish a matrix into such complicated cavities as you can press wax into, and you can not withdraw matrices from such cavities as readily as you can the wax. If you make a mistake in your cavity formation, and your wax does not draw, the wax itself tells you of the error you have made in the draft and it then can be corrected. The beauty of this method is being able to make a model of your filling in wax; thus you can make all sorts of extravagant arrangements in the morsal surfaces of teeth; you can make all kinds of compound cavities and still fill them with a single filling. For that reason, it has been my constant practice in the last few months, in all cases of approximal cavities which come to me in teeth which already have some sort of an old filling, to remove that filling, replacing it with a single inlay for both cavities, rather than to leave that old filling in place. And, in the same way, if I find a doubtful place on the approximal surface while I am working on the morsal surface, it is best to unhesitatingly chisel down into the approximal surface as Dr. Van Woerst recommends in Figs. 2 and 5. In the lower molars I very frequently cut into the buccal sulci, following it to its extremity, not making it very deep, but making an extension down into that vulnerable area. I would rather go to that little additional trouble (there is practically no extra pain to the patient,

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because I make the cut with a square edged stone) rather than to feel that I am leaving a place that may later on invite decay under my inlay.

Dangers of Hydrofluoric Acid.

In connection with making gold inlays, however, I want to give you one little note of warning which I hope none of you will ever need. Dr. Taggart recommended to us hydrofluoric acid for cleaning the gold, and to my surprise I learned to-day that that is exactly what is used for cleaning the castings of iron and steel. Workmen in foundries have learned to use it much diluted and to wear rubber gloves. Of course I have always known it was a dangerous thing to handle, and I supposed I was doing so with the greatest caution, but I found in a short time all the glassware in my laboratory was being ruined; glasses not nearer than four or five feet were clouded by the hydrofluoric fumes. Recently I injured myself with it and have been unable to do any work requiring the use of any force whatever since that time, and I dwell on this because all of the acid that reached my finger was by touching the cork; yet that tiny drop getting under the nail caused me intense pain all that night, and the wound required nine weeks to heal.

I have been doing this cast inlay work for more than a year and am indebted very largely to Dr. Van Woert. To-day we put in our two hundred and third cast gold inlay, in about a year's time, and I now put in gold inlays where I formerly inserted amalgam fillings. I have used the pure gold altogether.

I have often argued with Dr. Van Woert on the question of using pure gold and the claim is made that it will spread, but I contend that if I get absolute occlusion, pure gold is better and I some times see my patients two or three times before I get it, and have to burnish and reburnish in order to get the results.

The burning of Dr. Ottolengui's finger by the use of hydrofluoric acid makes me feel that this is an opportune time to suggest, that instead of using an acid in cleaning the casts, I use carburet of iron, that is to say the ordinary black stove polish; I take a small brush and apply the carburet of iron to my wax impression, and that gives me, on casting in a mold which has been allowed to cool, a cast cleaner than I can get with the subsequent use of any of the acids.

Dr. Ottolengui.

Do you let it dry?

Dr. Nies.

Yes, I let it dry on the wax. It is the ordinary brick stove polish our mothers used.

Dr. Meeker.

Dixon's stovepolish?

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Dr. Nies.

Yes, Dixon's stove polish. I rub the brush on the brick, taking up enough of the black lead to cover the wax model. That I invest in any of the ordinary investments. I formerly used plumbago mixed with plaster, but I found that it was not porous enough. It seems that a certain degree of porosity is desirable in an investment; that is, there must be some space into which the molten gold can push the air that is in the mold, the air that takes the place of the molten wax. I found too dense an investment would not work, although I did like that investment in the casting of full gold plates, where I was able to vent my casts. Full gold plates I have cast, using four sprues radiating from a common center; these sprues are all of resinous or sticky wax, which afterward melt out. I make them by simply rolling an ordinary piece of wax, and they act just as the metal sprues do and then melt out. Were these *metal* sprues it would be impossible to withdraw them. Numerous inlay fillings can be cast at once by this same method.

I am glad to hear Dr. Ottolengui state that he carves his wax inlays, undercuts them, before he invests them. I find that a very helpful thing. I always do that under cold water, taking care not to cut away my frictional sides, that is the sides that come in contact with the cavity walls. I think that is most important in retaining inlays, although I also cut grooves around my gold inlays, cutting in the wax because it is much easier to cut wax than it is to cut gold inlays.

I have found that the "Carborundum" stone is not as good as the ordinary emery wheel for the cutting of gold inlays. Emery cuts quickest for the reason, as I believe, that under the microscope it will be seen that the blocks of emery break down and leave ragged edges much like the edge of an egg shall, and constantly present new sharp surfaces. "Carborundum" is excellent for cutting porcelain inlays, but for gold inlays I find the emery wheel is much better, or the wheels that the S. S. White Company sells as "Carborundum," which as a matter of fact are not "Carborundum." Those are very excellent for that purpose.

I also use in finishing these fillings what is known as "White Diamond," I do not know of anything that equals it in quickly polishing the gold inlays, which I always polish in my laboratory on a lathe, finishing with rouge.

I have been very much interested and instructed

Dr. Gaylord, New York. by Dr. Van Woert's paper.

I would like to ask Dr. Van Woert if he knows what the alloy is in the gold that he spoke of. Is that a platinum alloy, doctor?

Dr. Van Woert.

I think it is; I am not sure about that.

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Dr. Gaylord. I have argued that pure gold cast in this manner is too soft to stand the stress of mastication, and have therefore been using alloyed gold, and I noticed I was not getting the cervical margins I wanted. I have therefore made a test case which I will use at the Connecticut Society meeting, making a model of rather extreme shape with a cast inlay of pure gold and also one of 22 karat—and the discrepancy in the 22 karat is very perceptible. I believe that is the case with either silver or copper alloyed gold, and I have had a hope all the time that a platinum alloyed gold would not have that difficulty.

Dr. Ottolengui spoke of cutting out the wax model, to avoid approach of the gold too close to the pulp. In a case of that kind where I wished to protect the pulp, I would first place some cement in the cavity; that is, protect my pulp by placing cement in the cavity. But I have been doing quite a little cutting out of the back of wax inlays by a little method that may be of interest to you. I have taken the electric heated point, commonly spoken of as the gutta-percha point, and wound upon it a little cotton leaving the extreme point bare. By heating the instrument so that it readily melts the wax you can very delicately cut the wax where you wish and the wax which melts is immediately absorbed by the cotton so that it does not heat up or spoil the shape of the model. As soon as the cotton is saturated, just touch it with a piece of bibulous paper or a napkin which will take off the wax and you can proceed with the work. I am to show that at the Connecticut State meeting, and have made a little instrument to demonstrate it, as they do not have the electric current there. It is a little copper point which will heat in a flame with a silver sleeve with the cotton on it.

There is another point I would like to suggest, and if you will do a little experimental work along this line you may be able to come to a conclusion sooner, and that is along the line of drying and heating up the investment. It is natural to suppose that an investment, if you allow it to dry out and then heat up slightly, will make more solid investing material and will give you better results. I have been working along those lines and have had considerable trouble with the character of the investment, and have changed around and am doing just the opposite of that. I have made several castings within a half hour from the time I commenced to mix the compound, and I am getting far better results, smoother inlays, absolutely no cracking, and just as good a fit, if not better, than by the old method.

Dr. Ottolengui.

How do you dry out your investments?

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Just as soon as the investment is sufficiently set,
Dr. Gaylord. I put it right on the flame; of course if you use a very hot flame you will produce so much steaming in the investment that little pieces will flake off, it will explode; you should not heat it up too rapidly, but heat it up quickly and make the casting without drying out on the sand bath, or waiting for the investment to dry out by standing. I used to think that if I could make the investment during the evening and allow it to stand over night, and do my casting the next morning, I was getting pretty good results, though I did have considerable cracking, but since I have worked along the other lines I have not had a single crack in the investment.

I would like to say a word in reply to Dr.
Dr. Ottolengui. Gaylord. I think the investment and the mixing of the investment is very important; and I know that Dr. Taggart makes the claim that, as nearly as possible, exact methods should be used in managing this investment, to which end he has designed a double ended ladle, one end of which will contain the proper quantity of investment and the other end a proper quantity of water, and you will find that if you mix Taggart's investment in that proportion, you will have a very stiff mixture. Those of us who handle cement know oxyphosphate mixed thin is a cement; mixed thick it is a filling material. In other words if you want strength, durability and density you must put more material with your liquid. And so it must be with this investment material and Dr. Taggart proceeds just as Dr. Gaylord does—that is, puts his investment over the fire and finishes the whole work as quickly as possible. Not only that, but in his flask ring he has a hole drilled, and after the ring is filled he turns it upside down and presses against the investment material, so that the water oozes out and the investment is made more dense.

Some of our scientific investigators have found
Dr. Morrison. that there are some points in the extension of cavities which are very important to consider. Dr. Van Woert spoke of one; just below the point of contact you find the area of greatest liability to decay. The particles of food usually lodge just below the point of contact, so that it makes that place very susceptible to decay. If I understand that correctly, Dr. Van Woert will sometimes, where there is an extensive cavity on one side of the tooth, go over into the other approximal surface and extend it just below the contact point.

I want to ask the doctor if he cuts just below the point, or much beyond it, because this is a very important area, and I would not think it wise to stop the margin of the cavity at this particular point.

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I will answer the last question first. If I were
Dr. Van Woert. to extend a cavity from one approximal surface to the other I would carry it down far enough to leave a surface that is easily examined at any time and beyond the point where food will collect and lodge, where it is an effort to remove it. In other words, I would not stop the filling at the contact point, but below it; I would not go down to the cervix; I would go about half way between the point of contact of the knuckle and the cervix itself. I do not think it necessary to go below that, but to go far enough down so that you can see between your filling and the tooth and keep it under observation, and I think that is far enough below the line to prevent the recurrence of decay.

I do not think, from the course of the discussion, that you gentlemen appreciate the fact that I wanted brought out more particularly; the question of absolute occlusion. Dr. Schmidt made some reference to it. I did not mean that every point of the filling must touch every point of its opposing tooth, but I do mean this: Every surface upon a natural tooth has a specific purpose. The teeth opposing it on the other jaw have surfaces that conform to it approximately, and if the surfaces of an inlay are so arranged and carved that they meet with those of the others it does not make any difference whether they touch or not; when the pressure is brought upon them in the stress of mastication the strain is distributed equally over the entire filling. That is what I mean by an absolutely correct occlusion.

I would rather have the filling short of actual contact and have the opposing morsal surfaces conform with one another than I would to have it touch. The idea is to get an equal line of distribution for the crushing of food.

Dr. Ottolengui. You want them to meet like male and female dies?

Dr. Van Woert. Yes.

Dr. Schmidt. After you get that occlusion practically right, there will be no place where there is any undue pressure, and that being the case the pressure is distributed evenly.

Dr. Van Woert. I wish to be sure that some of the gentlemen do not interpret me as meaning that there should be some high places, and some low, but I would rather have it a little bit shy, than have undue pressure.

It is very rarely that I have to touch a filling after it is put in the

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mouth, for occlusion; once in a while I make a mistake, I am sorry to say, but usually I get them low enough so that the result is as you saw it on the models.

I want to thank Dr. Nies for what he told us to-night; that pays me for coming over to read this paper and talking to you as I did; I mean his suggestion about graphite or black lead.

Dr. Gaylord says that there is a minute discrepancy between inlays of pure gold and of 22 karat gold. I am not at all surprised at that, because gold alloyed with silver or copper, or any of the alloys of that kind, I believe will do that; but I believe that the non-oxidizable gold will give you just as sharp a filling as any pure gold. I know further that it is soft enough to burnish and yet hard enough to withstand any stress of mastication, which is more than I can say for pure gold.

On motion a unanimous vote of thanks was extended to the essayist.

On motion a vote of sympathy was extended to Mr. Delmas, the photographer, because of the unfortunate accident which occurred to him while preparing to take a flashlight photograph of the gathering.

On motion adjourned.





Under the above caption Dr. Paul B. H. Quedenfelt published an article in the *Dental Cosmos* for June, in which he criticises a discussion of gold inlays which appeared recently in ITEMS OF INTEREST. Dr. Quedenfelt not only misunderstood the remarks to which he takes exception, but it would almost seem that he misjudges the true usefulness of the gold inlay. He starts with the statement that he must attack certain remarks because "they declare war forever against the queen of all operative dentistry—the Gold Filling." It is doubtful if any of the gentlemen who took part in the discussion before the Second District Dental Society would admit that they had "declared war" on this issue. Dr. Quedenfelt says:

"Dr. Gaylord, of New Haven, said: 'Operations heretofore made with inferior materials will hereafter be made by this method, and millions of teeth will be saved; these millions have been lost.' What does Dr. Gaylord mean by 'inferior materials'? Have we not had the pure gold for operations? Is this an 'inferior material'? I ask, *If* millions of teeth have been lost by filling them with gold, how will those dentists who have made such poor gold fillings now handle the gold inlay method? Will they save millions of teeth by it? Will they all become



at once skilled and good mechanics to correct their lack of skill in operations? Is not the gold filling just as well a strictly mechanical performance? and who dare say that those who can not make perfect gold fillings will make perfect gold inlays? Which is worse, a bad gold filling or a bad gold inlay? I believe a bad gold filling is the better, as it will be more easily detected to be bad by the patient, because it will become rough on the surface, and it may yet preserve the tooth for a long time; but a bad gold inlay will cause secondary decay all around the border, and that much quicker than a gold filling, whereas the surface will remain smooth, and the patient will only feel that the inlay is defective after much disturbance is produced."

It seems odd that Dr. Quedenfelt should have so misconstrued Dr. Gaylord's remarks, and that gentleman must have been much astonished to learn that he had called "gold" an "inferior material." Dr. Gaylord said: "Operations heretofore made with inferior materials will hereafter be made by this method, and millions of teeth will be saved," etc.

When Dr. Gaylord spoke of inferior materials, by what standard was he measuring? By gold, of course. The statement, put a little plainer, would read "Operations heretofore made with materials inferior to gold," etc. The idea which Dr. Gaylord intended to convey is that the gold inlay is destined to save millions of teeth which have heretofore been but inadequately patched up with amalgam, cement, gutta-percha and the like. And this is gospel, the gold inlay will not only do this, but will to a large extent displace the shell gold crown.

Thus the eloquent defense of the gold filling made by Dr. Quedenfelt was unnecessary since there had been no attack, but when he asks "which is worse, a bad gold filling or a bad inlay?" he makes an erroneous reply. He declares his preference for a bad gold filling, because it will sooner be detected by the patient, and because the bad inlay will cause secondary decay all around its border. Curiously enough, the present writer would make exactly the opposite choice. He would prefer the bad gold inlay, if not too bad, because even though the margins might not be absolutely perfect it is rare indeed to see secondary decay around a gold inlay which is good enough to remain in place; on the contrary thousands of gold fillings which remain in place, nevertheless permit the entrance of caries, even to the extent of pulp destruction. And who has not seen that "bluish shadow" about fillings made by men certainly above the average?

ITEMS OF INTEREST

Dr. Quedenfelt continues as follows:

"In approximal cavities of molars and bicuspid, where the decay is near or below the gum line, I would never use a gold inlay, because it is very much harder to get a perfect adaptation with it than with tin or gold. At the approximo-gingival border the tin and gold is the most perfect filling, and it will be preferred by those operators who are accustomed to its use and have seen its merits, in spite of all gold inlay methods. There are certainly some places where gold inlays are better than gold fillings; they are mainly very extensive decays which involve mostly the occlusal surfaces; but never will a gold inlay be preferable to a foil filling in deep approximo-gingival cavities. There is hardly any place in the mouth where a gold filling can not be made, as long as the rubber dam can be applied, with hand pressure. Hand pressure is absolutely the best system of all gold filling methods."

The gentleman is entirely mistaken when he says that "a gold inlay will never be preferred in deep approximo-gingival cavities." Not only may absolutely perfect inlays be made for such cavities, even when the devastation extends below the gum line, but the technique of accomplishing this result is such that many thousand more men of average ability will learn to save teeth in this manner than by any other that has yet been advocated.

What does Dr. Quedenfelt offer in place of the gold inlay in these most trying places? Tin and gold and hand pressure! If this method is so good why has it made so slight an impression upon the dental profession, considering that it has been preached and practiced for over half a century?

The doctor makes the same mistake that many others have made. Because *he* can save teeth easily and well in a certain way, he concludes that it should be universally practiced. If there were any one way equally good, and equally easy for all dentists, it would have been exclusively adopted long ago. The personal equation is a mighty factor, and the true value of any method must be found in the answer to the query "How many can successfully save teeth by this means?" and we venture to predict that a thousand will succeed with gold inlays to one that will successfully utilize tin and gold and hand pressure.

Finally Dr. Quedenfelt quotes and criticises as follows:

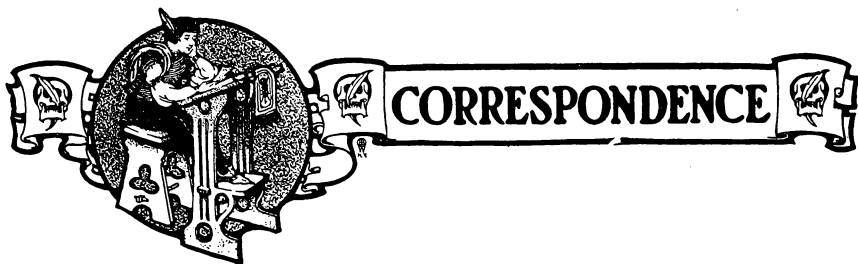
"Dr. Ottolengui says: 'Now that the inlay proposition has been made possible in metals, as well as in the ceramics, the entire art of filling teeth becomes prosthetic dentistry, because the operative method can be restricted to the preparation of cavities and the cementation of inlays,



and all the rest of the work can be done in the laboratory; and it is quite possible that in a short time the operating room will be 4 x 4 ft., and the laboratory will occupy the rest of the suite.' Well, we shall see!—I do not believe it. The door which is now opened by introducing the gold inlay to the profession is the door which leads to careless operations; it will enable those who do not care for perfect work, but only that which looks good to the patient, to paste into a cavity almost anything called a gold inlay, and charge a larger fee for it than for the good old gold filling which he was never able to do."

Here again Dr. Quedenfelt has not quite comprehended. It was just a year previous that Dr. Hart Goslee read a paper before the same society bewailing the retrogression of prosthetic dentistry, and it was because Dr. Goslee was again present that the remarks quoted were uttered. Moreover they are true. The perfect filling of teeth with both gold and porcelain may now be done largely with the assistance of the man in the laboratory. The doctor, in his criticism, again invites the suspicion that so great is his antipathy to inlays, that he has had little if any experience with them. The inlay process, whether with gold or porcelain, is no lazy man's process. Let such a man undertake inlaying with gold and after his sixth failure he will probably return to the filling of teeth with "inferior materials."





The American Medical Association Take Up Army Dental Legislation.

Editor ITEMS OF INTEREST.

Dear Sir—I take great pleasure in informing you that at the recent national meeting of the American Medical Association just held in Chicago, it was my pleasure in the House of Delegates to introduce the following resolutions:

“WHEREAS, The value of the services of the dental corps of the Army is now thoroughly recognized,

“Resolved, That the Legislative Committee be instructed to further such legislation as will place the dental corps in the army on a commissioned basis, such legislation to meet the approval of the War Department.”

They were referred to the Reference Committee on Legislation, who brought in the following report, which was unanimously passed by the House of Delegates:

“The House of Delegates last year endorsed a bill, providing for the dental corps in the Navy, and it seemed desirable to make the proposed resolution more general so as to embrace both branches of the science, and the committee recommends the adoption of the following resolutions:

“The House of Delegates of the American Medical Association, recognizing the great importance of the services of the dental corps of both Navy and Army, and appreciating the importance of placing both on a commissioned basis, authorizes the Committee on Legislation to assist in securing the passage of such bills as meet the approval of the War Department, or the Chief of the Bureau of Medicine and Surgery of the Navy.”

The work was made much easier by the magnificent amount of missionary work done by the dentists throughout the country, especially in the middle and far Southwest, as I found that the delegates from these

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sections appeared to be thoroughly posted by their local dentists as to the matter at issue. This, in no light measure, contributed to the result attained, which I am confident will lead to the placing of the army corps on a commissioned basis this coming winter. I have the personal assurance that the Committee on Legislation of the American Medical Association will use the same efforts to obtain successful legislation in this matter as they have used in obtaining the reorganization of the medical department of the Army.

Respectfully yours,

M. L. RHEIN,

Delegate from the Stomatological Section.

A Plea for More Ethical College Training.

Editor ITEMS OF INTEREST.

Dear Sir—The article by Dr. A. W. Thornton, Chatham, Ont., subject "A New Specialty," has just been read by me with great interest. I think this one of the finest papers I have seen in any dental journal in years. I am glad he has written it and hope it will be productive of much good. The thought has often come to me of the need of a general revolution in our ranks. It would seem that with the state meetings and local dental societies that we could so educate the public mind that the charlatan and get-rich-quick dentist would soon be no more. If the college sent us men each year possessing high ideals, how soon this much desired end would come! The trouble is not in the teaching, I am sure, for most of the instruction in the colleges (if one is to judge by the curriculum), is good. The trouble lies with the student himself and the greed of the college to have a large attendance. I will warrant there is not a college in this country that is not carrying men from year to year whom they know, as well as the student body knows, are not the type of men that will reflect credit either on themselves, the dental profession or the college that gives them their diplomas.

Why should not the test be made at the entering of the student into college instead of at the close? The chair on ethics may be all that could be desired, but of what avail is it if the student has no ethical sense to appeal to? We must look further back than the colleges for relief. We must go to homes and bring our professional men from the homes where high ideals have been instilled into the minds of the young from infancy up.

ITEMS OF INTEREST

Let the test be made at the outset and let the college matriculate only those who give evidence of being capable of receiving the instructions and who also possess character.

The college that will graduate a man who spends his time in the lounging room "shooting craps," while the other students are taking lectures, need never expect that man to reflect credit on his alma mater. This is the kind of fellow who exploits himself in the newspapers when he gets out of college as a great expert. Why should a college be permitted to carry such men in their classes, and then turn them out on the public when the only reason for keeping them is to get the fee?

This may seem a little strong, but the faculty knows who the weak students are, and the student body also knows. When a student that is not honest finds that he can cut lectures and by some hook or crook "Pony" his way through and get his diploma, he will do it, and the result is when he gets out of school he has not learned enough to build up a practice that will sustain him. What does he do? Rushes into the newspapers and exploits himself as an expert, a painless dentist, and fattens on the credulity of ignorance. The honest dentist coming in contact with these fellows frequently suffers. The dental profession suffers and we know their patients suffer. The student should be taught that honest dealings are as important as the proper insertion of a filling and that the college will only graduate those that are capable and really possessed of good character.

Why should a student who has worked hard three years and spent all his money (and in the majority of cases this is true) be required to go before a state board to answer a lot of obsolete questions and endure an examination that not one practitioner of dentistry in fifty could pass. If the college is a good one any state should welcome its graduates. If it is not good, close it up, and only allow colleges to matriculate students that are themselves possessed of good moral characters. About the time we have such things we will be enjoying the millennium. As dentists and as a professional body I feel that it is as important to put our efforts together to bring about this change as above suggested as it is to learn how to cast a gold inlay that will fit. I offer thanks to Dr. Thornton, and I trust, Mr. Editor, you will give this article space in your next issue, for although it may not appeal to all I know it will find a hearty response in the hearts of those who, like myself, know what it is to battle daily to build up an honorable profession and be compelled to see it dragged in the mire by quacks that are only out for money.

Yours truly,

Bonham, Texas.

H. H. MITCHELL.



Investigation of Pyorrhea.*

Editor ITEMS OF INTEREST.

Dear Sir—Our object in writing your society is to enlist your co-operative efforts in having the president of your society appoint a committee, as our society has done, for the purpose of investigating pyorrhea alveolaris, its causes, symptoms (in its earliest stages), origin, treatment, cure and its prevention. We are to report at our next annual meeting.

This disease is the knottiest problem that confronts our profession and our mission is, therefore, to write to all dental societies with a view to getting their co-operation by appointing committees to help in this investigation, so as to concrete the opinions of the profession at large on this disease.

The list of questions which you also receive with this letter is to be answered by your committee and to be forwarded to the chairman of this committee. We hope in this way to arrive at a settlement of some of the questions, and we may in the future be able to obtain aid from the government to ferret out the cause, treatment, cure and prevention of this disease.

Yours fraternally,

No. 620 Canal Street,
New Orleans, La.

E. H. RAMELLI, Chairman.

Committee—Drs. Jules J. Sarrazin, H. E. Belden, E. H. Ramelli.

QUESTIONS.

Do you consider pyorrhea alveolaris incurable?

Do you know of any cases that have been cured?

In what stages were the cases when first under observation?

Have you ever recognized the disease before serulal calculus appeared?

What were the symptoms?

Do you think salivary calculus has any effect on the disease?

Were the patients under your observation of robust or delicate physique?

Have you ever seen the disease in youth, and at what age?

Do you know of any properly treated devitalized teeth being lost by the disease?

Did the devitalization and root canal sterilization and filling precede or follow pyorrhea development?

* This letter has been sent out by the Louisiana State Dental Society.

ITEMS OF INTEREST

At what time of life do you find treatment most efficacious?

Do you find pyorrhea more in males or in females?

Do you find it more in the upper or lower jaw?

Does the disease attack all teeth alike?

Were patients ever afflicted with syphilis, tuberculosis, uricemia, chronic indigestion or chronic constipation?

Have you ever seen cases where malocclusion was a cause?

Do you think autointoxication a cause?

Do you think uricemia a cause?

Is it a disease of the gum?

Is it a disease of the alveolar process?

Is it a disease of the periodontal membrane?

(It is of the utmost importance, in order to insure the success of this vital investigation, that your society should take this matter up at once and favor us with an early answer, giving the disposition decided upon at your meeting and action taken.)

Dental Office Chief.

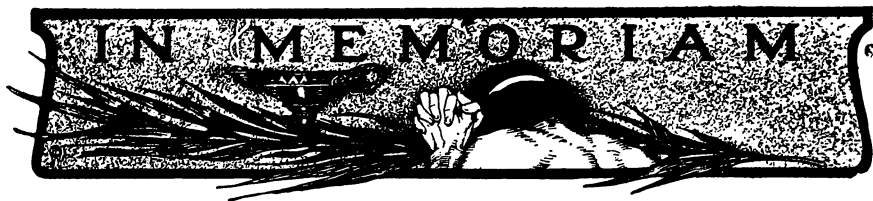
EDITOR ITEMS OF INTEREST.

Dear Sir—Will you please publish a notice of warning to dentists to look out for a man giving the name of E. H. Vaughn or Robt. Baughn, or who is a laboratory man, a fairly good plate worker; height about five feet, seven inches; weight about one hundred and forty pounds; somewhat stoop shouldered; yellowish gray eyes; sandy hair and mustache; bold, florid complexion; claims to be from the South, gave Greenville, S. C., as his home, and referred to Dr. J. P. Carlisle, who reports that he knows nothing about him, except that at one time he had a man by the name of E. H. Morris, who absconded.

This man is wanted in Washington for grand larceny, and any information to the chief of police will be appreciated. He removed from my laboratory four crowns, one ten-tooth bridge and a gold plate on the 19th of March.

Respectfully yours,

CHAS. W. CUTHBERTSON, D.D.S.



Dr. H. Newton Young.

In respect to the memory of Dr. H. Newton Young, the Susquehanna Dental Association of Pennsylvania at their annual meeting, May 21, 1908, adopted the following resolutions:

WHEREAS, Death has removed from us our esteemed friend and co-worker, Dr. H. Newton Young; and

WHEREAS, In his decease we have suffered the loss of a member who had an active and earnest interest in this association, and who had the welfare of the entire profession at heart; therefore be it

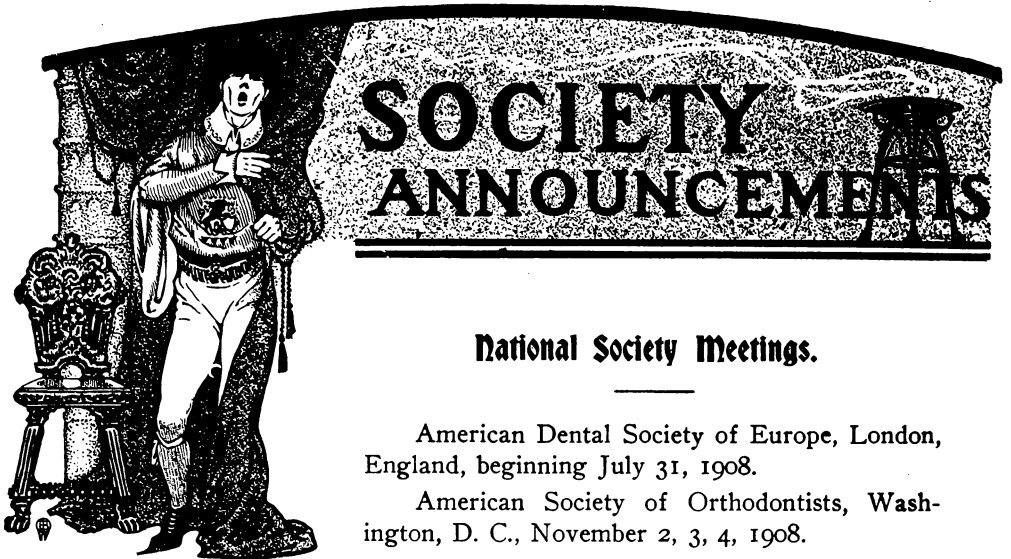
Resolved, That we, the members of the Susquehanna Dental Association, in annual session in Williamsport this 21st day of May, 1908, while of necessity yielding to the inevitable, deeply deplore his death, and earnestly unite with the bereaved family in mourning his untimely loss, and assure them of our admiration for his high personal and professional qualities; and be it further

Resolved, That these resolutions be spread upon the records of this association, a copy sent to the bereaved family, and copies sent to the dental journals for publication.

C. S. VAN HORN, Chairman,
JOHN C. HERTZ,
C. C. WALKER,

Committee.





National Society Meetings.

American Dental Society of Europe, London, England, beginning July 31, 1908.

American Society of Orthodontists, Washington, D. C., November 2, 3, 4, 1908.

National Association of Dental Examiners and the National Association of Dental Faculties, Back Bay, Boston, Mass., July 24, 25, 27, 1908.

National Dental Association, Boston, Mass., July 28, 29, 30, 31, 1908.

State Society Meetings.

New Jersey State Dental Society, Asbury Park, N. J., July 15, 16, 17, 1908.

Ohio State Dental Society, December, 1908.

South Dakota Dental Society, Lead, S. D., July 23, 24, 1908.

Southern Illinois Dental Society, Greenville, Ill., October 27, 1908.

Virginia State Dental Association, La Crosse, Wis., July 21, 22, 23, 1908.

National Dental Association.

Section 1—E. P. Dameron, chairman, 58 De Menil Building, St. Louis, Mo.; H. E. Kelsey, vice-chairman, Commonwealth Bank Building, Baltimore, Md.; J. V. Conzett, secretary, Dubuque, Iowa.

SOCIETY ANNOUNCEMENTS

Prosthetic dentistry, crown and bridge work, orthodontia, metallurgy, chemistry, and allied subjects.

Section 1 presents the following papers:

Dr. H. A. Pullen, of Buffalo, N. Y., "Orthodontia."

Dr. Geo. H. Wilson, Cleveland, Ohio, "Some Phases in the Construction of Complete Vulcanite Dentures" (exhibiting 30 to 40 slides showing appliances and points in construction).

Dr. Charles Channing Allen, Kansas City, Mo., "Metallurgy."

Section 2—A. R. Starr, chairman, 10 East 92d Street, New York, N. Y.; J. T. Lippincott, vice-chairman, 1427 Walnut Street, Philadelphia; V. S. Jones, secretary, Bethlehem, Pa.

Operative dentistry, nomenclature, literature, dental education and allied subjects.

Section 2 presents the following papers:

Dr. Burton Lee Thorpe, St. Louis, Mo., "The Contributions of New England Dentists."

Dr. George W. Weld, New York City, "Characteristics of Calcified Tissues in Two Complete Sets of Human Teeth, Free from Caries."

Dr. Joseph Head, Philadelphia, Pa., "The Protecting Action of Saliva from Decalcification of Enamel by Acids."

Section 3—D. J. McMillan, chairman, 11th and Locust Streets, Kansas City, Mo.; L. D. Archinard, vice-chairman, New Orleans, La.; F. E. Cobb, Secretary, 307 Masonic Temple, Minneapolis, Minn.

Oral surgery, anatomy, physiology, histology, pathology, etiology, hygiene, prophylaxis, materia medica and allied subjects.

Section 3 presents the following papers:

Dr. Clyde Davis, Lincoln, Nebraska, "Method of Treatment of Purulent Empyema of the Maxillary Sinus."

Dr. Eugene S. Talbot, Chicago, Ill., "Acidosis and Indicanuria in Diseases of the Mouth, Jaws and Teeth."

Dr. Thomas B. Hartzell, Minneapolis, Minn., subject later.

Dr. Arthur H. Merritt, New York City, subject later.

Since the publication of the partial programme in the June journals sixteen more clinics have been received. It has been thought best not to republish the programme, but simply to give the list of additional clinics. These are as follows:

ITEMS OF INTEREST

CHAIR CLINICS.

- F. S. Belyea, D.D.S.....Brookline, Mass.
Tin and gold fillings.
- Bliven, C. Frank, D.D.S.....Worcester, Mass.
Contour operation with cohesive gold on mesial surface of first molar.
- Brigham, W. H., D.D.S.....So. Framingham, Mass.
(a) Anchored porcelain in an incisor.
(b) Burnished gold filling in distal of upper cuspid.
- Eames, George F., D.D.S.....Boston, Mass.
Pyorrhea.
- Prentiss, C. C., D.D.S.....Hartford, Conn.
To be announced.
- Weeks, Thomas E., D.D.S.....New York City
Currents in childrens' teeth.

TABLE CLINICS.

- Belyea, F. S., D.D.S.....Brookline, Mass.
Artistic arrangement of artificial teeth and plumpers.
- Campbell, Dayton D., D.D.S.....Kansas City, Mo.
Campbell method of casting dentures.
- Crews, J. T., D.D.S.....Jackson, Tenn.
Protrusion of lower jaw, reduced to occlusion with hood and pressure on point of chin.
- Davis, Clyde, D.D.S.....Lincoln, Neb.
Original method of constructing veneer inlays applicable to the same cavity preparation as for foil or amalgam fillings.
- Dunwoody, J. E., D.D.S.....West Philadelphia, Pa.
Different uses of the casting machine.
- Howe, Horace L., D.D.S.....Boston, Mass.
Orthodontia.
- Lett, Isadore, D.D.S.....Boston, Mass.
To be announced.
- Sykora, R., D.D.S.....Boston, Mass.
Orthodontia hinge.
- Tracy, William D., D.D.S.....New York City
Gold inlays.
- Watkins, S. C. S., D.D.S.....Montclair, N. J.
A demonstration in dental prothesis, demonstrating the taking of impressions, the application of tin foil in vulcanite work and the arrangement of artificial teeth to imitate nature.

This will make a total of one hundred and sixty operations upon both days. These have been divided for convenience and will be given upon the mornings of July 29th and 30th at the Tufts College Dental School.



SOCIETY ANNOUNCEMENTS

The college has generously offered the dental infirmary for clinics. This room occupies the first floor of the dental wing and is fully equipped with aseptic chairs and cuspidors, dental engines and brackets. Steam sterilizers are provided for the disinfection of instruments. It is one of the most complete dental infirmaries in this country. Everything will be in readiness for clinicians at 9 A. M.

After this hour members of the association and the visiting profession will find the clinic room alive with wide awake men, demonstrating at the chair and table, operations in gold, silicate and metal fillings, porcelain and gold inlays, jacket crowns, orthodontia and prosthetics.

Dr. C. H. Land, of Michigan, one of the pioneers in porcelain work will clinic upon the artificial enameling of vital teeth. Dr. Land expects to be in Boston several days previous to the meeting and will carefully prepare the best cases to complete upon the clinic days.

Drs. Horace I. Beemer and V. M. Rundle, from New Jersey, will operate upon the same patient, using Dr. Black's method. The first day Dr. Rundle will make filling in mesial surface of upper bicuspid. Upon its completion Dr. Beemer will make the operation in distal surface of upper first bicuspid. Dr. J. V. Conzett, of Iowa, also skilled in Dr. Black's method, will give an operation in gold filling. This will give the Eastern profession an opportunity of seeing methods which the men of the Northwest have so enthusiastically adopted. Dr. J. B. Ridout, of Minnesota, will make it interesting by casting inlays, crowns, bridges and a few novelties on both days. These are a few of the many interesting clinics in store for those who visit the dental infirmary upon Wednesday and Thursday mornings.

There is an interesting variety of surgical clinics scheduled for both days in the infirmary of the college. Upon the morning of each day Prof. Wm. E. Chenery, of Boston, will give a fifteen minute lecture upon adenoids in the amphitheater at 10.45 illustrated with the projection apparatus. This will be followed by operations in the infirmary. This can not fail to interest those in attendance, which also might be said of all the prospective surgical operations.

The laboratory exhibitions to be given by three of the Tufts College professors, in their own laboratories, present a unique grouping of demonstrations. Prof. G. V. N. Dearborn will take normal vital functions for his subject, using the frog, chameleon, and tortoise in illustrating the vital movements. Dr. H. Carlton Smith, professor of chemistry of Harvard, will give us the benefit of his untiring analyses of saliva. The third laboratory exhibit will combine the scientific knowledge of Profs. G. A. Bates and Timothy Leary upon bacteria in the mouth and the lesions arising therefrom.

ITEMS OF INTEREST

As a whole the programme arranged is full of interest from beginning to end. The committee would gladly have had every professional man with something of interest to demonstrate upon the programme, but when they must reach a membership so widely scattered, not all the best men are available or known.

They wish to extend a "thank you" to all who have responded, also for the many expressions of good will which have accompanied the letters received. They also desire to thank the editors of the different journals for their assistance in reporting the progress of the committee.

A favor is asked of the clinicians: That each one shall mail or bring to the meeting a synopsis of his clinic. This will greatly aid the committee in arranging reports of clinics for publication in the transactions of the meeting.

This finishes the report of the clinics up to date. Whatever changes or additions to the programme are now made will appear upon the final programme of the meetings.

The following men have comprised the members of the clinic committee:

Maine, New Hampshire and Vermont—Dr. A. J. Sawyer, Manchester, N. H.

Massachusetts—Dr. G. C. Ainsworth, Boston, Mass.

Rhode Island—Dr. Carl R. Lindstrom, Boston, Mass.

Connecticut—Dr. Ned A. Stanley, New Bedford, Mass.

New York, New Jersey and Delaware—Dr. C. E. Parkhurst, Somerville, Mass.

Pennsylvania—Dr. H. B. McFadden, Philadelphia, Pa.

Maryland and District of Columbia—Dr. Clarence J. Grieves, Baltimore, Md.

Middle South and Southern Atlantic States—Dr. F. W. Stiff, Richmond, Va.

GEORGE E. SAVAGE,
Chairman Clinic Section.

RAILWAY RATES.

New England Association, which includes the territory of New England, grants a rate of a fare and one-third on certificate plan. Trunk Line Association, which includes the territory of Buffalo, Niagara Falls, N. Y.; Erie and Pittsburg, Pa.; Bellaire, Ohio; Wheeling, Parkersburg and Huntington, W. Va., and points east thereof, except New England, a rate of one and three-fifths, also on certificate plan. All other territory grants summer tourists' rates in existence and effective to Boston



during the summer. Those using the Trunk Line rates will deposit their certificate, together with 25 cents, with the secretary, Dr. C. S. Butler, immediately on arriving at the meeting.

Invitation to The Canadian Dental Association.

The Canadian Dental Association meets in Ottawa, August 4, 5, 6, 1908, and extends an invitation to the members of the National Dental Association of United States to attend its meeting. Arrangements have been made with the Canadian Pacific Railway Company that all tickets from the West over the Canadian route to Boston will be honored via Ottawa on the return trip.

This will give those attending the National Dental Association an opportunity to visit the St. Lawrence, city of Montreal, and the capital city of Canada, and in its position to be close to what has been termed the playground of America. No better hunting, fishing and camping can be found than what is within the reach of the city of Ottawa. Besides the Canadian Dental Association would feel it a great honor to have with them any of their confreres of the United States who choose to accept this invitation.

W. G. L. SPAULDING, Secretary.
A. E. WEBSTER, M. Ex.

Wisconsin State Dental Society.

The thirty-eighth annual meeting of the Wisconsin State Dental Society will be held at La Crosse, July 21, 22 and 23, 1908.

Wednesday and Thursday mornings will be devoted to clinics, other sessions to papers and discussions.

HARVEY N. JACKSON, Secretary.

Wells Bldg., Milwaukee.

Rhode Island Board of Registration in Dentistry.

The Rhode Island Board of Registration in Dentistry will meet for the examination of candidates at the State House, Providence, R. I., Tuesday, Wednesday and Thursday, July 7, 8 and 9, 1908. Application blanks and particulars may be obtained from

H. L. GRANT, Secretary.

1025 Banigan Building, 10 Weybosset Street, Providence, R. I.



Illinois State Dental Society.

At the forty-fourth annual meeting of the Illinois State Dental Society, the following officers were elected for the ensuing year: President, Arthur D. Black, 31 Washington Street, Chicago; vice-president, E. F. Hazell, Springfield; secretary, R. J. Hood, Sparta; treasurer, C. P. Pruyne, 92 State Street, Chicago; librarian, J. T. Cummins, Metropolis.

The 1909 meeting of the society will be held at Danville, May 11, 12, 13, 14.

R. J. HOOD, Secretary.

Sparta, Ill.

Vermont State Dental Society.

At the thirty-second meeting of the Vermont State Dental Society, held in Montpelier, Vt., May 20-22, the following officers were elected for the ensuing year: President, Dr. Harry F. Hamilton, Newport; first vice-president, Dr. Charles F. Meacham, Bellows Falls; second vice-president, Dr. A. Z. Cutler, Bennington; recording secretary, Dr. Thomas Mound, Rutland; corresponding secretary, Dr. Grace L. Bosworth, Rutland; treasurer, Dr. W. H. Munsell, Wells River. Executive committee, Dr. L. E. Mellen, Middlebury; Dr. F. H. Brown, Enosburgh Falls; Dr. Dana E. Dearing, South Royalton.

The next meeting will be held the third Wednesday in May, 1909, the place of meeting to be decided by the executive committee.

THOMAS MOUND, Secretary.

Rutland, Vt.

Colorado Board of Examiners.

Examinations granted to holders of diploma only. Examination fee \$10. No special examination granted to practitioners already in practice. No interchange of license with any states. Examination the first Tuesday of December at Denver.

HOWARD T. CHINN, Secretary.

307 Mack Building, Denver, Colo.